THE IRON AGE

A Review of the Hardware, Iron, Machinery and Allied Trades.

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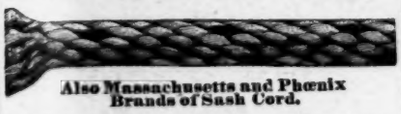

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THE IRON AGE

THURSDAY, DECEMBER 5, 1901.

A French Motor Bicycle.

The Werner.

Three features are conspicuously noticeable in the motor bicycle designed and built by Werner Brothers, 40 Avenue de la Grand Armée, Paris: 1, the general arrangement or disposition of the parts; 2, the extreme simplicity of the construction; 3, the convenient location of all the governing devices, and the evident reliability of their action in controlling all the operations.

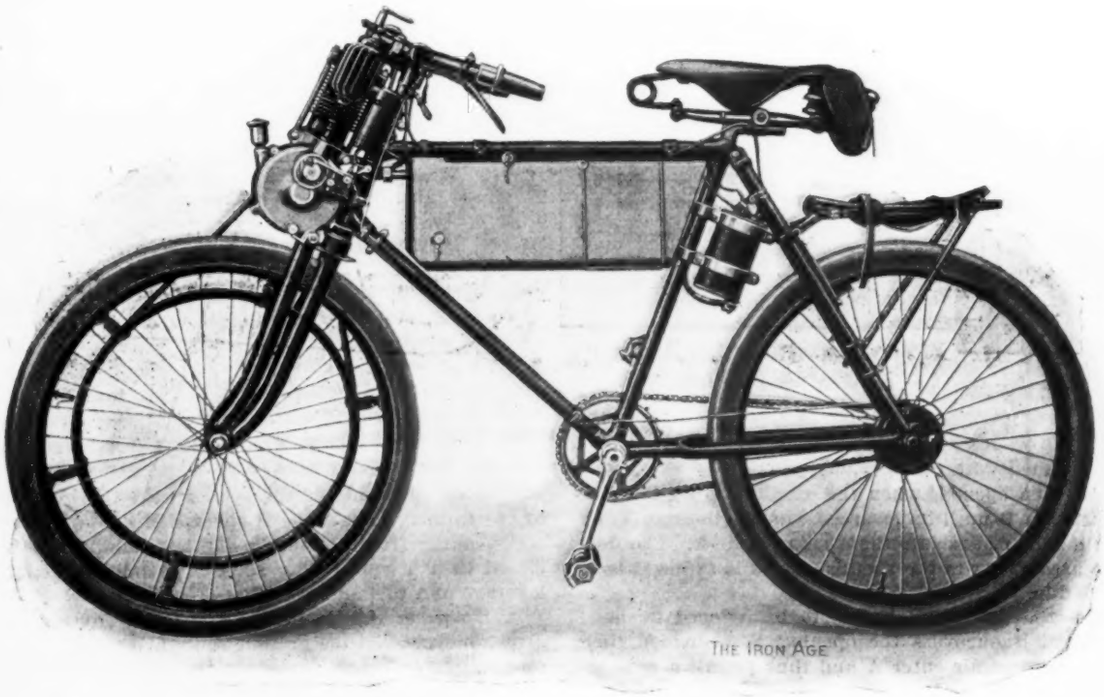
The frame is similar to that of an ordinary bicycle, with the exception that the fork is double and supports the motor. The engine shaft carries a small grooved pulley from which extends a belt to a similar pulley on the front wheel. The belt is of folded leather, V shaped to correspond with the grooves in the pulleys. The driven pulley is eight times the size of the other, so that at the normal speed of the engine, which is 1500 revolutions per minute, the front wheel makes 188 revolutions.

The reservoir or tank is suspended from the top bar of the frame, while the electric battery is secured just under the seat. Over the rear wheel is a frame for carrying baggage.

It will be observed that this arangement of the parts insures a more even distribution of the weights than is the case with motor bicycles using the rear wheel as a driver. In other words, there is, when the rider is mounted, a more uniform arrangement of the loads between the front and rear wheels, and the rear wheel is relieved of an excessive load, the front wheel being made to carry its due proportion.

Simplicity is a marked characteristic of the entire machine. It is apparent that the builders have pursued the most direct course toward the accomplishment of their object and have rigorously excluded all superfluous devices. This has not been carried so far as to impair either the durability or efficiency—in fact, both these elements have been increased.

Easy manipulation and reliability of operation are evident. All parts of the driving gear are grouped under the handle bar and all the controlling levers are within convenient reach. Without removing the hands from the grips the brake can be applied, and the force of the explosions in the engine regulated, or the engine can be stopped. Also, by means of devices within easy reach, the amount of gas entering the engine can be governed, a second brake can be brought into action, and the engine can be adjusted so that it will not act as an air compressor when the gas supply has been shut off, or when the electric ignition has been disconnected. Without the latter provision it would be impossible to propel the wheel manually, because of the resistance that would be offered by the engine.



THE WERNER MOTOR BICYCLE.

The Engine.

The engine is of the usual four-cycle type—that is, the piston receives an impulse every other revolution. The cycle is as follows, beginning with the piston at the top of its stroke: Upon the downward stroke the mixture of gas and air is drawn into the cylinder, and is compressed during the following upward stroke. Explosion now takes place and the piston is driven downward, this being the only stroke that imparts an impulse to the driving wheel. The next upward stroke expels the products of combustion and prepares for a repetition of the action.

The piston is of the barrel or trunk type in which the cylinder forms the guides, the connecting rod being attached to the interior of the piston. The crank shaft is formed with disks for balancing. The inlet and exhaust valves are of the poppet or mushroom pattern and both open into the explosion chamber. Both valves are nor-

mally held to their seats by springs. To permit the escape of the burned gases the exhaust valve is positively raised by a cam, which is so timed as to lift and hold the valve during one stroke in every four of the piston.

From what has been already said concerning the timing of the piston the action of these valves and the admission and expulsion of the gases will be understood. The first downward stroke of the piston creates a partial vacuum, and the explosive mixture enters behind the piston, the inlet valve moving inwardly against the slight tension of its spring. During the next (compression) stroke and the third (explosion) stroke both valves are held to their seats by the pressure. At the beginning of the fourth stroke, the final one of the cycle, the exhaust valve is lifted by the cam referred to and held open during the entire stroke, when the products of combustion are forced out through the muffler and the cylinder cleaned for another charge.

The muffler consists of a cylindrical tube pierced by rows of holes, 21 in all, near its bottom.

Reservoir and Carburetor.

The reservoir and carburetor, shown in the sketch, Fig. 2, are composed of two compartments, A and B, which communicate with one another through the two openings Y Z. Both of these passages can be closed or opened by the stop cock Q. After the openings have been closed the reservoir is filled with gasoline through the opening K, which is provided with a screw cap. The valve is then opened, when the gasoline flows into the compartment B until its level exceeds the passage Y, by which the air passes into the compartment A. The flow then ceases owing to the vacuum which is formed above the liquid in A.

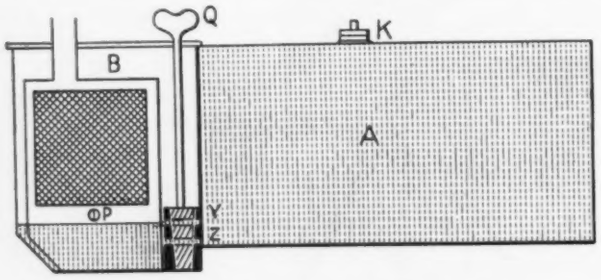


Fig. 2.—Sketch of Reservoir and Carburetor.

When the fluid in B begins to be reduced its level drops until it uncovers the opening Y, at which time some bubbles of air enter A and thus permit a new influx of the fluid into B.

Inside of B there is a box covered with metal gauze and with cotton fabric. This box is in communication with the admission tube. By virtue of the suction created by the motor upon its first downward stroke, as explained above, the outside air penetrates into B, is carbureted while passing through the gauze, and the mixture necessary for explosion is produced.

It will now be understood that the reservoir must be closed hermetically—a condition that is indispensable in order to maintain the correct level in B. This level must not extend above the valve P when the machine is in a vertical position.

Regulation and Control.

The motor can be stopped by three different means: Either by interrupting the current by turning the left grip of the handle bar, which breaks the circuit; by shutting off completely the admission of mixture by means of a handle placed in the admission valve, or by closing completely the gauge which regulates the carburization. The speed of the engine can be moderated by changing the time at which the explosion takes place, and by partially shutting off the admission of the mixture. The former is accomplished by the device shown roughly in the sketch, Fig. 3, and in position on the side of the engine case in the half-tone. The disk D is mounted on a shaft which makes one revolution to every two of the engine shaft, suitable gearing being employed to accomplish this. The disk is notched and in the notch enters the hammer carried upon the end of the vibrator spring A. Contact with this is affected through the platinum tipped screw B and the electric circuit thereby established. By means of a suitably connected lever on the handle the position of this device can be shifted. This, of course, changes the position of the notch in the disk D and its relation to the stroke of the engine. In other words, the time at which ignition takes place can be altered to suit the conditions. The explosion can be made to take place just before the completion of the compression stroke of the piston, at the instant of the completion of this stroke, or after the piston has begun its final downward stroke of the four. When ignition takes place in the first stage there is a great back pressure on the engine, which then acts as a brake. The maximum power is derived when the explosion occurs at or near the commencement of the final stroke.

Electricity is furnished by a dry battery carried in brackets under the seat.

Brakes.

The wheel is provided with two brakes, one acting upon the hub and the other upon the inside of the rim of the rear wheel. The first is a strap brake actuated by a lever on the right arm of the handle bar. The second consists of two brake blocks of hard rubber held in a stirrup on each side of the spokes near the upper part of the frame. This brake is operated by a twisted wire cord leading from a lever on the left handle and is inclosed in a T spiral wire tube. The hub brake has a leverage of 1 to 4 and the other of 1 to 5.

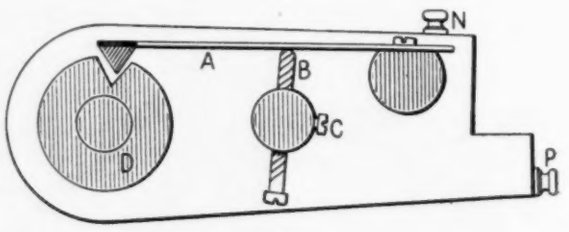


Fig. 3.—Spark Controller.

THE WERNER MOTOR BICYCLE.

The Werner Bros. were the first to introduce a motor driven bicycle. At the present time their wheels are the best known and most favorably received in both France and England. This wheel has won in both the Paris-Berlin and Paris-Bordeaux races. In the latter race, which took place in May of this year, it arrived first, having covered the entire distance of 588 km. in 12 hours and 23 minutes, including all stops.

Blackwell's Furnace Lining Chrome Ore.

Geo. G. Blackwell, Sons & Co., Limited, Liverpool, England, announce that they have arranged with the Harbison-Walker Company, Park Building, Pittsburgh, Pa., to take for the future the sole sale for United States and Canada of Blackwell's special furnace lining chrome ore. For upward of 20 years the firm have sold this ore to the trade generally, but particularly for use in open hearth basic furnaces. In Europe they claim to supply every furnace, and their trade has increased rapidly in the United States and Canada. The special chemical combination of their ore in chromium, magnesia, alumina and silica makes it a perfect refractory. The Harbison-Walker Company have, during the past year, used over 2000 tons of this ore. The firm will continue to work their own Lion brand alloys, for use in steel manufacture, from Liverpool, as heretofore, making as many personal visits to the United States and Canada as their large and increasing trade demands.

Operations of the Bankruptcy Law.

WASHINGTON, D. C., November 26, 1901.—The third annual report of the Attorney-General to Congress upon the operation of the Federal bankruptcy law has been compiled by E. C. Brandenburg, in charge of bankruptcy matters in the Department of Justice, through whose courtesy the advance abstract given below is presented:

The grand total of voluntary petitions in bankruptcy filed in the United States for the year ending September 30, 1901, is 17,015, this being made up of 9787 petitions filed during the first six months and 7228 during the last six months, thus showing a material falling off, as was anticipated in our several earlier reports as likely to occur. Furthermore, the number filed during the past year was about 3000 less than the year preceding, and about 2000 less than the year ending September 30, 1899.

The States showing the greatest number of petitions filed during the year are: Illinois with 2003 petitions in the northern district and 263 in the southern district, making a total of 2266 for the State; New York with 467 in the northern district, 937 in the southern district, 290 in the eastern district and 493 in the western district, making a total of 2187 for the State; Massachusetts with 1073; Alabama with 774 in the northern district, 133 in the middle and 27 in the southern, making a total of 904 for the State; Ohio with 446 in the northern and 320 in the southern, making a total of 766 for the State; Iowa with 396 for the northern and 305 for the southern, making a total of 701 for the State.

Nature of business.—An effort has been made to ascertain the nature of business in which the bankrupts were engaged, and the result shows that 1459 were farmers, 7068 wage earners, 2852 merchants, 248 manufacturers, 415 professional men and 1645 contractors, hotel and saloon keepers, real estate men and others of a miscellaneous character.

During the year 1992 petitions were filed to have debtors adjudged bankrupt, but of these 307 were dismissed either because the court had no jurisdiction or because no act of bankruptcy had been committed. Of the involuntary proceedings compositions were confirmed in 73 cases.

The past year discloses the fact, as was anticipated in the earlier reports upon the practical operation of the bankruptcy law, that the number of voluntary petitions would shortly decrease in view of the belief that a good proportion of those filed during its earlier operation were those of old insolvents seeking to avail themselves of its advantage by securing a discharge co-extensive with the limits of the United States. The present report shows that but 17,015 voluntary petitions were filed, which is more than 3000 less than were filed during either of the two preceding years' operation of the law. It may be safely said that these reports are a fair criterion of business conditions, and the fact that more persons have not seen fit to take advantage of the law is clearly indicative of the continued business prosperity which has prevailed for the past few years.

Several important opinions construing the law have been rendered during the past year by the Supreme Court of the United States. The most important and far-reaching is that of Carson, Pirie, Scott & Co. *vs.* the Chicago Title & Trust Company. In this case the question involved was as to whether or not a creditor who had received a payment on account was obliged to surrender the same before proving his claim for the balance, and the Supreme Court by a vote of 5 to 4 held that this should be done. As this decision reaches the very foundation of our commercial credit system it has received considerable criticism pro and con, and various recommendations have been suggested with reference to amending the law in this respect. While the feeling is almost universal that this provision of the law should receive the attention of Congress, yet a difference of opinion exists even among the commercial community as to what that amendment should be.

A bill has been introduced in Congress by Representative Ray, suggesting various amendments of the law, all of which have received the most careful and detailed attention on the part of the merchants of the country as well as various legal associations, and, on the whole, if enacted would materially strengthen the weak points which the practical operation of the law has developed, with the result that the United States would have one of the most equitable bankruptcy laws, so far as all classes, debtor and creditor, are concerned, that exists in any country on the globe.

While it is perhaps not in the province of this Department to make recommendations, yet it is suggested that if Congress decides to undertake the extensive amendment of the law, then the Ray bill would certainly remove most of the weak points which the practical operation of the law has developed. If, however, Congress does not intend to make such extensive amendments, but prefers that they should be limited, then it seems to us that, as recommended in our previous reports, section 14, with reference to the question of discharges, should be amended by making it more difficult to secure a discharge on the part of a dishonest debtor. Secondly, that section 23, which was held by the Supreme Court in the case of Borden *vs.* Hawarden Bank to restrict the trustee in instituting suit for the purpose of recovering fraudulent transfers or preference to the State court unless by consent of the defendant, be amended by giving the Federal Court jurisdiction of such actions without the consent of the defendant. This will result in substituting the much more expeditious machinery of the Federal Court, in which bankruptcy matters are entitled to priority, for that of the State court, in which the action of the trustee is more or less dependent upon the grace of the court, it being recognized that Congress has no authority to impose any jurisdiction upon a State court, and that therefore it lies within the power of such courts to delay such proceedings, or entertain or refuse jurisdiction, as they see fit. Thirdly, that section 57 of the law, which is interpreted by the Supreme Court as requiring a creditor to surrender any payment received on account prior to the proving of his claim for the balance, whether innocently or not, should be amended by authorizing the creditor to retain any payment innocently received on account and prove his claim for the balance without surrendering such payments, but to receive no dividends on the balance until other creditors who had not received payments on account, and thus less favored, had received a percentage equal in amount to that received by the favored creditor, and then all to share *pari passu*. If, however, this should not be deemed wise, an amendment which also meets with favor is to authorize a creditor to retain any payment that may have been received on account, provided it was innocently received, and prove for the balance.

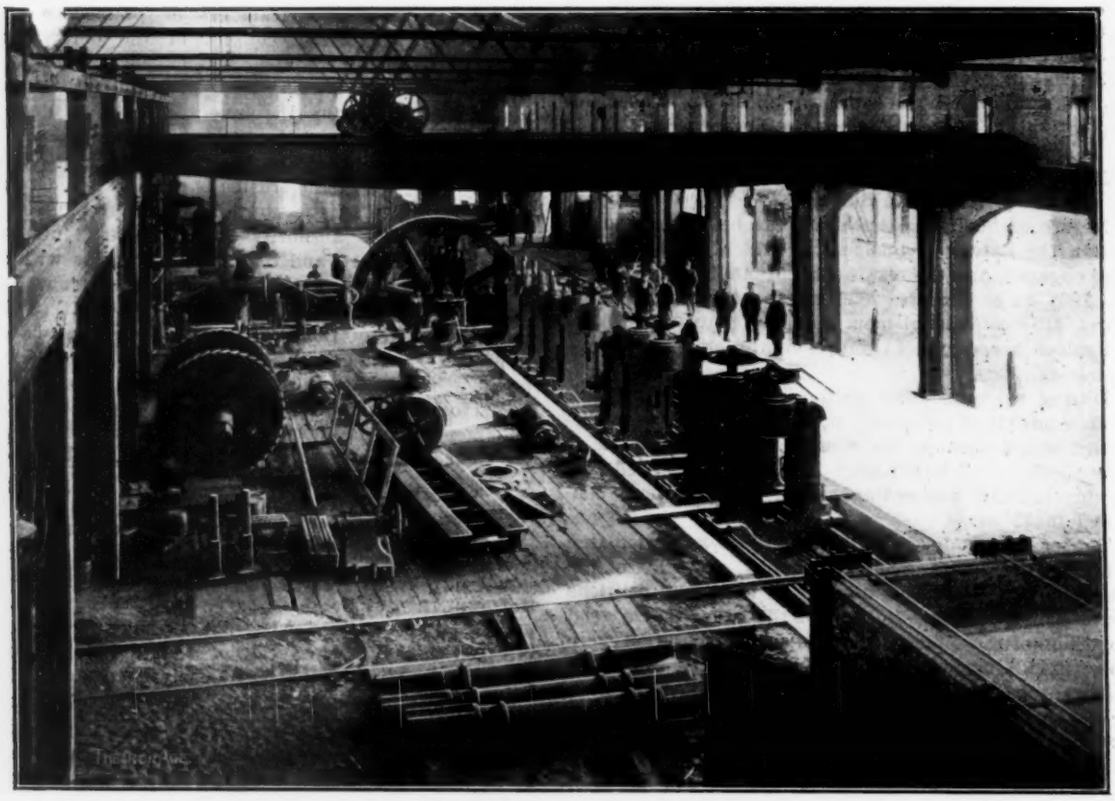
It might be suggested in this connection that the fees as now allowed by the law are reduced to a minimum, and that in order to maintain the high standard of the referees, many of whose abilities are unsurpassed and whose attainments might in another line demand a greater return, the fees should be revised so that they shall receive compensation commensurate with the amount of labor and skill required of them. Many of these referees are the peers of the judges of the Federal bench, and to secure a proper administration of the law such men should be retained in office. It would, therefore, seem wise that Congress should amend the law by fixing their fees at some reasonable amount and thus avoid the serious conflict now rising, whereby one judge construes the law liberally relating to the question of fees and allows a number of miscellaneous charges, realizing that the referee is underpaid and expecting through this means, to some extent, to compensate him for his labors, while the judge in an adjoining district may be a strict constructionist and allow nothing except such as is specifically provided by the law. This results in great hardship, and Congress should make the fees uniform instead of leaving them to the discretion of the various courts.

That the bankruptcy law is meeting with approval on all hands is best attested by the fact that the American Bar Association in its recent convention at Denver, the National Association of Credit Men at its convention at Buffalo and the Commercial Law League of

America at its convention at Milwaukee have by resolution reiterated their belief in the advantages of the law and recommended that it be kept upon our statute books. There are, of course, isolated cases where exception is taken, but when sifted it usually develops that such opposition grows out of its operation in some way working injuriously to an individual, and not because the law is not advantageous to the community of the United States as a whole. W. L. C.

The Waukesha Sheet Steel Company.

Illustrations are presented herewith of the new sheet steel works of the Waukesha Sheet Steel Company, located at Waukesha, Wis. Instead of investing considerable capital in the erection of the necessary buildings the company leased the buildings formerly used as repair shops and recently vacated by the Wisconsin Central Railway Company. The buildings were admirably adapted for the purpose to which they have been put, requiring but slight alterations and additions.



THE WAUKESHA SHEET STEEL COMPANY.

The latest developments in sheet rolling practice were adopted in the selection of machinery and other equipment, so that the works can be referred to as a thoroughly modern six-mill plant, with all that is necessary for turning out from 75 to 100 tons of steel sheets daily. The company will manufacture steel sheets, black and galvanized, plain and painted, flat and corrugated.

The main building is 120 x 375 feet, constructed of brick throughout, and has a steel trussed roof covered with slate. This building contains six hot mills, two cold mills and one 24-inch bar mill. The hot mills comprise three 26, one 28, one 30 and one 32 inch. A 1500 horse-power 30 x 60 inch engine, having an 80-ton fly wheel, is installed in this building to operate the mills, as well as sufficient finishing shears for squaring the sheets and bar mill shears for cutting the bars to the proper length. All the shears are operated by electric motors. A 15-ton electric traveling crane, having a 60-foot span, built by Pawling & Harnischfeger, Milwaukee, Wis., traverses a runway over the engine, roll trains, &c. A 60 x 300 foot lean-to, which adjoins the building, contains two bar mill heating furnaces, six sheet and pair furnaces and two double annealing furnaces.

The boiler house is a brick structure, 90 x 100 feet, equipped with Lynn type vertical water tube boilers, manufactured by the Tudor Boiler Mfg. Company, Cincinnati, Ohio. This battery of boilers is operated by automatic stokers, made and installed by the Green Engineering Company of Chicago, Ill. The feed water and purifier is operated by a Cookson heater, made by the Bates Machine Company of Joliet, Ill. The boiler house also contains two large size Deane outside packed plunger pumps. The entire equipment is automatically arranged and everything necessary for decreasing the cost of operations has been introduced.

The machine shop is housed in a brick building 40 x 60 feet, with slate roof, and is thoroughly equipped with all necessary modern tools, including drills, planers, lathes, &c., all of which are operated by electric motor. A blacksmith shop adjoins the machine shop.

The electrical equipment is furnished by the Northern Electric Company of Madison, Wis., and consists of one 150-kw. dynamo, driven by a Brown-Corliss 20 x 40 inch 250 horse-power engine. Steam is furnished for this equipment by a special battery of boilers. The dynamo furnishes power to operate all the machinery in the plant with the exception of that operated from the main engine. The building containing the electrical power plant is of brick, 60 x 150 feet.

The galvanizing department occupies a brick building 80 x 240 feet. In addition to the galvanizing tanks this building contains the shipping room. Another building is the stock house, 100 x 160 feet. Switches from the Wisconsin Central Railway run into the plant, and ample track facilities are provided for loading and unloading as many cars as may be required.

The company have completed arrangements to install two 50-ton basic open hearth furnaces, as well as a puddling department, to furnish their steel and iron bars.

A two-story building, 50 x 60 feet, is in process of erection, which will be used for office purposes. The officers of the company are: President, F. J. Patterson; vice-president and general manager, J. E. Jones; secretary and treasurer, Geo. Firmenich. The company also maintain an office in Chicago, located in room 1403, Masonic Temple.

Pacific Coast News.

SAN FRANCISCO, CAL., November 25, 1901.—It was predicted some time since that the strike in the iron trade would come to a close after the municipal election, and it had been claimed previously that with the coming of the winter season the short hour day of nine hours, usual at that time of the year, would give an opportunity to a great many men to return to work without appearing to give up any principle, and that this would lead insensibly to a general resumption of operations, leaving the question of wages to be settled afterward. And this has happened in part. There is more or less reticence practiced by the parties to the agreement, but in about half a dozen cases the men have gone back to work nine hours a day practically on the old schedule.

The officers of the Machinists' Union claim that they have gained an advance of 7 to 12 per cent. on old rates, but this is again denied. The truth seems to be that the shops where the strike has been settled have made the best terms they could, as also have the men, for the sake of bringing the strained condition of affairs to a close as far as they are concerned. Indeed, both sides would be glad to put an end to the strike at once if there was no outside interference, and there are very few of the workmen who do not deplore the strike as much as any employer. In the majority of the cases where a settlement has been made there is practically no competition with the East—hence it was simply a question of charging more for the work done. And where work has been done an extra charge has been made and the customers were glad to pay it. But where we come into direct competition with the East that was hardly possible.

San Francisco cannot hope permanently to charge higher prices for iron work and machinery than the Eastern manufacturing centers. She has at present to obtain her raw material in the East, and every advantage that might be obtained through freight rates would be offset by this—besides, the rates back to the interior are much heavier than those from the Middle West this way. The big shops and the Union and Risdon Iron Works still remain as firm as ever and will not recede an inch from the stand that they have taken, and some of the large machinery and pump works are just as firm. The number of men at work is increasing every day, but the force employed is only about one-half what it was before the inauguration of the strike. Taking the whole of the shops, the number of men at work, union and nonunion, is somewhat over one-half what it was previous to May 20.

The general public and those outside of trade union circles have almost forgotten that, except in the cases referred to, the fight is contested as stubbornly as ever.

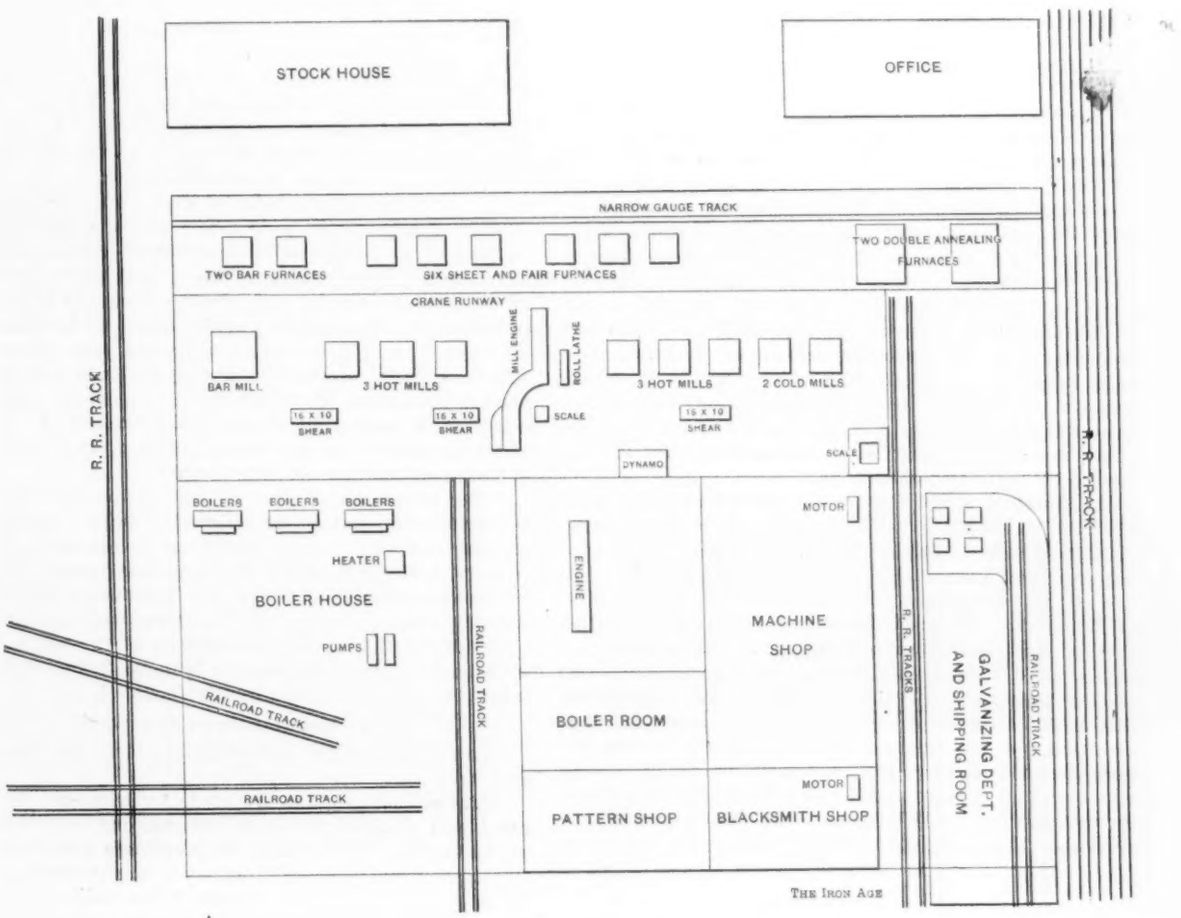


Fig. 2.—Ground Plan.

THE WAUKESHA SHEET STEEL COMPANY.

As the two big shipbuilding firms will not give way and would, if given sufficient time, fill the place of every man out, it is looked upon as probable that there will be a landslide to work before the winter is over. The men have now been out a little over six months and they have fared very poorly during most of that time, except where they had savings, and these savings, except where they were large, have slowly but surely melted away. There will be more work this winter than usual; so that those who come back can all probably find employment.

Outside of the strike San Francisco has never had a better year, commercially or industrially. Eastern money has poured into this State for investment in various industries, notably oil, lumber, and gold and copper mining, like water. In some lines, such as redwood and sugar pine lumber, the demand cannot be supplied with the facilities at hand, and if it could, there are not cars enough to carry the products East. Prices have

gone up and in sugar pine the lists have been suspended. All this makes a big business for the machinery and hardware men and, indeed, for all in the iron trade who are not affected by the strike. Prices follow closely the trend of the markets in the East. In some manufacturing lines, such as those of cables, the demand is very great, and with the advent of the Ballou Company to the control of the Market street system of street railroads the activity will be greater still, as all the cables will be made in this city.

The Clearing House exchanges have been for the past couple of weeks over 30 per cent. of those for the same time last year, when we had no strike, and they are increasing every week. This of itself tells the story if nothing else did. And we have just had glorious rains that have extended to all parts of the State and put everything in first-class condition for abundant crops next year. J. O. L.

The Industrial Commission's Report.

Consolidation Alone to Be Dealt with.

WASHINGTON, D. C., December 3, 1901.—The fact that the Industrial Commission will expire by statutory limitation on December 15, taken in connection with the physical impossibility of completing all its work on the plan originally devised, will result in the abandonment by the Commission of all its projected work except that relating to the trusts unless an extension of two or three months can be secured from Congress within the next ten days. Unless this extension is granted the Commission will make no attempt to report upon the transportation, immigration, labor, agricultural, and other important questions upon which it has taken a vast amount of evidence, but will concentrate its energies upon the report dealing with the history of the trusts in detail and making specific recommendations for legislation to restrict their operations.

The members of the Commission have been doing considerable missionary work since Senators and Representatives began to arrive here for the purpose of testing sentiment with regard to a possible extension of the life of the Commission, but with unsatisfactory results. Certain of the Commissioners express the conviction that the big combinations have found the Commission an annoyance and a standing menace to their general welfare, and have exerted their influence to prevent the desired extension. No evidence is produced in support of this assertion, but it is used as the basis of the expressed determination to send to Congress a report on the trusts which shall be as comprehensive as though the Commission were charged with no other duties, and which shall recommend legislation as radical as a majority of the Commission can be induced to agree to.

Increased Publicity.

At the present time a majority of the Commission has agreed to one proposition only—namely, that increased publicity shall be given to the operations of large corporations doing an interstate commerce business, or that may be induced to incorporate themselves under a Federal charter law, if it is decided to recommend the enactment of such a law. In any event it is proposed to create a new Governmental bureau, the head of which will have the same authority to require reports at regular or irregular intervals that the Comptroller of the Currency now has to call upon the banks for statements of their condition. Beyond this point the Commission splits, and there is now no reliable indication as to whether an agreement by a majority will be reached on any other recommendations. It is a significant fact that the most radical members of the Commission are also the most active, but inasmuch as the Commission's report, to carry any weight, must be signed by 10 of its 18 members, there is always the possibility that the radical measures toward which those now engaged upon the report are tending may be rejected by the majority when the final vote is taken.

A Review of the Evidence.

In this connection the Commission has just completed a review of the most recent evidence taken concerning the so-called trusts and certain large corporations in the iron and steel trade, the testimony of whose representatives has not heretofore been reviewed. Some interesting suggestions are embraced in this review with regard to trust regulation, the tariff, &c., which doubtless have a bearing upon the final conclusions of the Commission. Referring to the effect of trusts upon industrial life, the Commission says:

"There appears to be a wide difference of opinion on the part of both employers and employees as to the effect of industrial combinations on industrial life. On the one hand it is contended that industrial combination is a natural evolution of business and is conducive to the prosperity of the country; that the formation of industrial combinations tends to cheapen the cost of production, and that in the end the consumer will profit from this through the lowering of prices. On the other hand it is held with equal positiveness that trusts are injurious to the best interests of the country and that higher prices are the inevitable result of their formation. Other witnesses are of the opinion that it is beyond the power of industrial combinations to exercise absolute control over prices, and that the matter will regulate itself. The opinion is expressed that the majority of merchants and manufacturers are controlled by the belief that reasonable prices, fair dealing, and fair profits are the best basis for continued prosperity. One witness, while expressing his belief that the tendency of industrial combinations is to lower prices, says that the making of lower prices is a matter of less importance than the making of uniform prices, and states that one of the greatest benefits to be derived from the formation of industrial combinations is to be found in the fact that all buyers are put on an equality and that prices are stable. It is believed that our foreign trade will be extended by means of industrial combinations, and the statement is made that people abroad are already attributing the growth of our foreign trade to the formation of vast combinations in this country.

"The greatest evil growing out of the formation of industrial combinations is believed to be the corrupting influence of such combinations on the politics of the country, and the assertion is made that trusts exercise an unwarrantable influence over political affairs, municipal, State, and national; that they have unwarrantably interfered with the free exercise of the suffrage by workmen and have improperly influenced the action of legislative, executive and judicial bodies."

The Regulation of Trusts.

With regard to the regulation of trusts the Commission says:

"Various suggestions are made by witnesses for the regulation of industrial combinations, one or two advocating national control, and one favoring a constitutional amendment empowering Congress to act if there is any doubt about the present power; while another would have the Federal and State governments act in conjunction with each other in the enactment of legislation. Other suggestions are that concerns be prohibited from refusing to sell their products to dealers who handle similar goods manufactured by other concerns; that prices be regulated so that they shall be uniform throughout the country and shall not be extortionate; that capitalization be restricted, and that publicity be given to the affairs and accounts of great corporations. One witness distrusts legislative attempts to deal with combinations, and looks to the increase of education and organization on the part of the working people for the remedy of the evils which he believes exist. Another witness thinks that the only way to prevent the further growth of combinations is to deprive them of tariff protection."

No Tariff Revision.

It is highly significant that the Commission has found a very general unanimity of opinion concerning the desirability of letting the tariff alone. On this point the report says:

"Witnesses are almost unanimous in expressing opposition to any changes in our present tariff policy or in existing tariff schedules. Not one advocates a general tariff revision, and although a number of witnesses

point out specific inequalities or would be glad to have specific changes made in certain designated schedules, only one expressing an opinion on the subject is willing, for the sake of having such changes made, to have the matter of tariff revision taken up. There would have to be a very 'serious and troublesome state of affairs,' in the opinion of one witness, to justify the undertaking of a general tariff revision. One manufacturer, although announcing himself to be a free trader by conviction, declares that the adoption of free trade in this country would unsettle everything, and wants the tariff left untouched. One witness speaks in favor of the extension of the policy of reciprocity. The business depression of 1893 and following years is attributed by several witnesses to tariff changes, and the development of a number of specific industries is attributed by other witnesses directly to tariff protection. It is the opinion of the two witnesses who touched upon the subject that the removal of the tariff from trust products would injure the domestic competitors of the trust more than it would injure the trusts themselves. One witness speaks in favor of the creation of a permanent tariff commission and believes that if the members of the commission were selected because of special fitness and without regard to their party affiliations the appointment of such a commission would result in a better adjustment of tariff schedules than is otherwise possible."

Exports of Machinery.

In reviewing the testimony of certain representatives of the iron and steel industry the Commission takes up locomotives, power engines, armor plate, drop forgings, transmission machinery, &c.

"Locomotives," says the report, "have been exported for the last 40 years, and a large export trade has been built up. At first the trade was confined chiefly to Cuba and South America, but within the last 25 years it has been extended to the Eastern Hemisphere, and its growth has been very great in the last 10 years. American locomotives are now sent to almost every country where railroads are in operation, some locomotives having been sent to England, France, Germany and Russia. As in most European countries the railroads are controlled by the Government, foreign tariffs cut no great figure in the American export trade. The advantages possessed by American locomotive builders are found in the great capacity possessed by their plants, and in their excellent facilities, which make it possible to fill a large order in a very short time; in the superiority of American locomotives in respect to size, type and details, and in the fact that American locomotives can be built at a less cost per unit of weight than the ordinary European locomotives. The export business of the Baldwin Locomotive Works constitutes a quarter to a third of its whole trade, and the company have agencies in England, Norway, Sweden, Russia, China, Japan and Germany. Long credits are not given by this company, but the larger part of the price of a locomotive is ordinarily paid when the contract is completed, a small percentage being retained for a time as a guaranty against defects.

"With the general improvement in business conditions in recent years came a great demand for power engines. The greatness of the demand is attributed by one witness, a manufacturer of steam engines, to the fact that because of the industrial depression, which began in 1893, manufacturers continued to use their old engines instead of buying new ones, and that when business revived the normal demand was increased by orders which, under prosperous conditions, would have been placed a year or two earlier. The cost of production of steam engines is apparently no greater in this country than abroad, in spite of the fact that higher wages are paid here, because of the greater skill of the workmen and the ease with which they adapt themselves to improved methods.

"The profit on armor plate is stated to be very large, one witness estimating it at 23 per cent., while another witness says that the profit is 'something enormous.' The large profits are justified, however, on the ground that an immense outlay of money is necessary in order to build an armor plant, and that the business is not continuous, and because of the great risk of rejection. The specifications under which armor plate is made for the United States Government are stated to be more severs than the specifications made by any foreign Government.

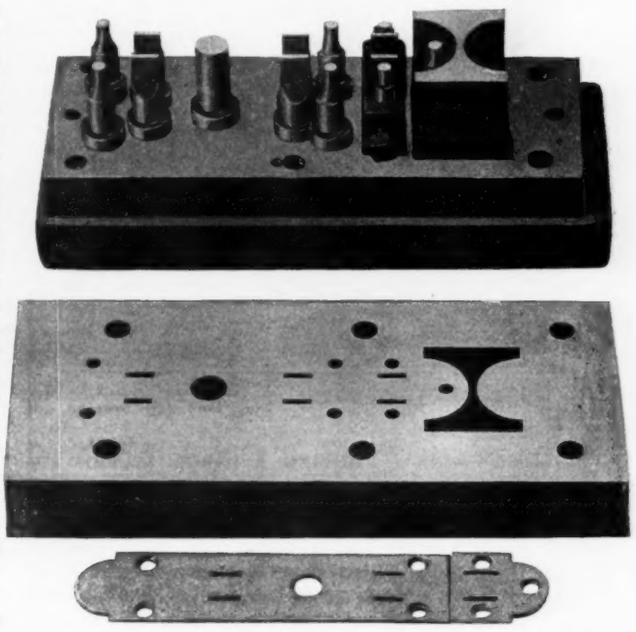
"There are a large number of concerns in the country manufacturing drop forgings, and all competing actively with each other, not only in the domestic market, but also in foreign markets. Drop forgings of all kinds are sold abroad, and one manufacturer reports that about one-eighth of the products manufactured in the works of his company are exported. Some few of the exported goods of this company are sold at lower prices in the foreign market than in the domestic market, but many of the goods are sold at higher prices abroad than at home. The company simply meet the market and get the largest price they can.

"Transmission machinery manufactured in this country is sold all over the world. One manufacturer dates the beginning of his export trade from the business depression of 1893, when, on account of the falling off in domestic trade, he was forced to look abroad for a market.

"The fluctuation in the prices of steel products in 1900 is attributed to the law of supply and demand, and to changes in the prices of raw materials, rather than to the arbitrary action of the steel combination. The formation of the United States Steel Corporation is thought to have had the effect of steadying prices." W. L. C.

The American One-Operation Piercing, Rounding and Cutting Off Die.

The acompanying illustration shows a set of dies for piercing, cutting off and rounding both ends of a steel switch plate at one stroke of the press, with practically



THE AMERICAN ONE-OPERATION PIERCING, ROUNDING AND CUTTING OFF DIE.

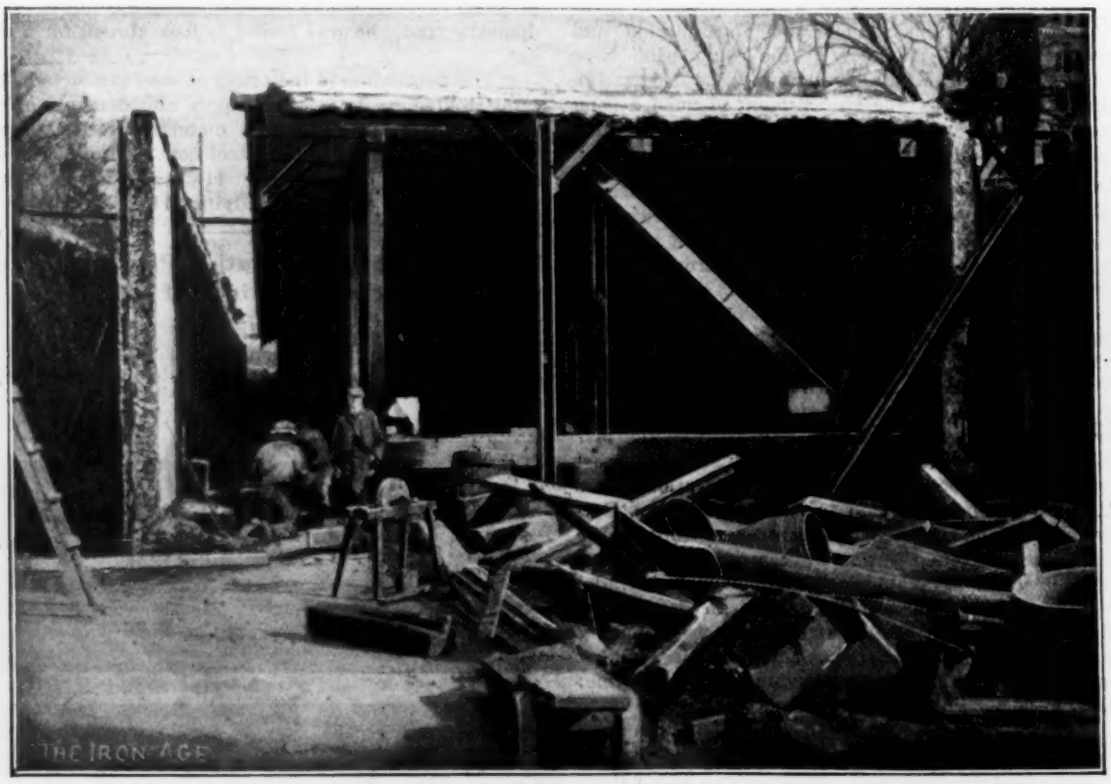
no scrap. The plate is shown in cut as it comes from the dies. The steel to be cut is in long strips, about ⅛ or ¼ inch narrower than the large T-shaped hole in the die; the width of the steel depending on the dimensions of the shoulder desired, extending off the round end. The length of the stamping is governed by a gauge set at a definite distance from the rear end of the die; this gauge can be adjusted, the length of the stamping varying accordingly. Should it be desired to have only one end of the stamping rounding, the other end cut straight, or have one end conical, the other end scalloped, this can be accomplished by making one or both ends of the large T-shaped hole the desired contour. These dies are made by the American Hardware Mfg. Company of Ottawa, Ill.

Moving a Large Section of the Rapid Transit Tunnel.

An interesting work is now in progress on the New York Rapid Transit Tunnel at 134th street and Amsterdam avenue. The two-track tunnel had been practically completed when it was decided to increase the capacity by adding a third track. As originally constructed, as shown in the engravings, the tunnel consisted of two masonry walls supporting the beams of the roadway. A center row of columns separated the two tracks. The section here shown is about 300 feet in length.

The first work was the excavation outside of the walls in order to provide the increased space required. The west wall was then separated, Fig. 1, from the roof, which was supported upon wooden posts. Diagonal timbers were introduced to hold the structure rigidly during the moving. Steel plates were inserted under the tunnel to provide a smooth surface for it to travel upon. Heavy timbers were placed along the floor, resting against the base of the east of right hand wall, and upon these rested the wooden posts holding the overhanging roof.

A row of screw jacks was inserted between the detached wall and the horizontal beams. These were all operated simultaneously, and the tunnel moved over to its new position. In much the same way the side wall is moved to its new location. The width of the new work will be seen in the second engraving. The contractors for the work are Terry & Tench of 131st street and Lexington avenue.



View Showing Bracing and Separation of Side Wall.

MOVING A LARGE SECTION OF THE RAPID TRANSIT TUNNEL.

Bethlehem Armor Plate Extensions.—It has been decided by the directors of the Bethlehem Steel Company, South Bethlehem, Pa., to increase the armor making capacity of their plant. The expenditure of $500,000 has been authorized to improve the plant so that the company will be able to produce 600 tons of armor plate per year, instead of barely 4500 tons, their present capacity. This enlargement will necessitate the installation of a quantity of new machinery, and is made in order to meet the urgent requirements of the Government in respect to armor plates.

Central Pennsylvania News.

HARRISBURG, December 2, 1901.

A company have been formed for the manufacture of steel specialties and shovels at Union Furnace, Blair County. The company will occupy land formerly used by the old furnace and the power will be taken from the Juniata River. The company will have offices in Philadelphia and Altoona.

The Frick & Geiser Works, at Waynesboro, have lately completed some large engines and there will be busy times at the works this winter. Fall shipments have been heavy.

The Harrisburg Foundry & Machine Works have lately entered on a new field of disposal of their direct connected engines. Recently an order was taken for a large engine to be placed on a steamship being built at the Harlan & Hollingsworth plant at Wilmington. Others of similar character are under construction. The works have shipped engines for the botanical gardens at Rio de Janeiro, Brazil, and for a sugar estate near San Juan, P. R.

The Chesapeake Nail Works, at Harrisburg, are running on large domestic orders. During this year they shipped cut nails to many foreign countries, considerable orders being filled for Cuba.

The Lebanon Chain Works have received some large orders for chains. The Government and several shipyards are having orders filled.

An electric light plant is being built near the Marshall Furnace, at Newport, Perry County, which when completed will light the town and many private houses. The power will be furnished at the furnace, which is in operation.

The Lackawanna Iron & Steel Company are dismantling their Scranton works and are shipping some of the machinery to Lebanon, although most of it goes to Buffalo.

There is more activity at Danville. One rolling mill

is running, and there is talk of inducing manufacturing companies to locate there, as many fine sites with good frontage are available. It is hoped to bring the town back to its former prominence as an "iron town," although the furnaces have been removed. s.

Notes from Great Britain.

The Prospects for Structural Steel in Great Britain.

One of the departments in the steel industry which is most likely to increase in popularity in this country is that of structural steel for building purposes. There is quite a large trade done even now in beams and girders for what you in America would call small buildings, but what are considered big buildings over here. The representatives of such firms as the American Bridge Company and Milliken Brothers are kept quite busy specifying for the erection of large warehouses upon modern lines. Hitherto, however, the idea of high buildings for office accommodation, similar to those so popular in America, has not gained so much ground as might perhaps have been expected. The whole question has now been brought to a head by a proposal which has been launched upon the public with startling and almost dramatic effect. A syndicate proposes to erect such a building at a cost of $10,000,000. The particulars of this building as given out by Frederick B. Esler of New York, the promoter, are as follows: "The site of the proposed building has a frontage to the Strand of 750 feet, with even longer frontages to the adjoining new streets, which are being opened. It has an area of 125,000 square feet. The architect's drawings, which accompany the application, show that the entire building will be seven stories in hight, but a portion will have three more stories, the whole of steel construction, with sandstone exterior. It will be equipped with every modern convenience. One of its special features will be a spacious rotunda, under a lofty dome, in the center of the building, intended to form a general rendezvous. The basement will consist of extensive safety deposit vaults, a large restaurant, engines, boilers and machinery for furnishing heat and electric light and the power necessary for running 30 lifts. The ground floor will contain special accommodation for banks and insurance companies requiring large rooms, and for shops. The upper floors will be given up to offices. It is estimated that the actual floor space, available for letting purposes, will amount to 900,000 square feet, and that there will be more than 6000 rooms in the building. The rents payable by the tenants will include charges for heating and electric lighting, cleaning and telephone service. Every office, or suite of offices, will contain a telephone, and the landlords will contract with the telephone company for a sufficient number of trunk lines to meet all requirements. The lift service will be in operation all night, and the building will be accessible day and night throughout the year. It is estimated that the annual maintenance charges will be upward of £35,000, and that the construction will probably take two and a half years."

The English press seems to be under the impression that this is an American enterprise, but from inquiries I have made I find that, providing the preliminaries can be carried through, the capital will be entirely British. Even for America this would be considered a big undertaking, but so far as I know there would be no legislative difficulty, and providing the money was forthcoming and the site acquired the building would go up as speedily as (say) the Frick Building in Pittsburgh. To illustrate the difficulties over here, however, I may point out that this building cannot be erected in London or anywhere else in Great Britain without obtaining special Parliamentary sanction. For it contravenes the Building acts in practically all of its essential features. The syndicate has applied to the London County Council for a 999 years' lease. Assuming this difficulty to be overcome they will next have to go to Parliament to obtain special powers to erect the building. During my recent visit to America I was two or three times asked to explain how this luxurious type of American building has not hitherto been used in England.

Fig. 2.—View Showing Where Tunnel Will Be Moved To.

MOVING A LARGE SECTION OF THE RAPID TRANSIT TUNNEL.

Legal Restrictions.

I have been looking up the acts of Parliament and herewith append some of the provisions of the London Building acts, 1894 and 1898. From these it will be seen how very restricted are the opportunities of using structural steel on high buildings, as compared with any large American city. Section 41 deals with domestic buildings abutting upon a street, and insists that in the rear of every such building an open space, exclusively belonging to such building and of an aggregate extent of not less than 150 square feet, shall be provided for. Subsection 3 strikes at one of the fundamental difficulties which American structural steel manufacturers have to face. I quote the words almost *in extenso:* "The hight of any such building in relation to the space required in the rear thereof shall be fixed and ascertained as follows: *a.* An imaginary line (hereafter referred to as the 'horizontal line') shall be drawn at right angles to the roadway formed or to be formed in front of the building, and through or directly over a point in front of the center of the face of the building. *b.* The horizontal line shall be produced to intersect the boundary of the open space furthest from the said roadway." *c* provides in great detail concerning irregular forms. "*d.* A second imaginary line (called the 'diagonal line') shall be drawn in the direction of the building above and in the same vertical plane with the horizontal line and inclined thereto at an angle of 63½ degrees, and meeting the horizontal line where it intersects the boundary of the space furthest removed from such roadway. *e.* No part of such building shall extend above the diagonal line, except chimneys, dormers, gables, turrets or other architectural ornaments, aggregating in all to not more than one-third of the width of the rear elevation of such building and except in building which, under the provisions of this section, is permitted on the open space." I need not quote the other subsections of this clause. The real difficulty comes in the insistence of the authorities upon maintaining the diagonal line angle at 63½ degrees. All sorts of other provisions are made for buildings abutting upon two streets and for regulating the hight of the building according to the width of the street. Special leave has to be obtained from the County Council for the erection of all buildings exceeding 30 feet in hight. Thus section 47 ordains that a building not being a church or chapel shall not be erected on or be subsequently increased to a greater hight than 80 feet without the consent of the Council. If greater hight is desired the consent of the Council can only be obtained providing there be no appeal against such consent, (*a*) by the owner or lessee of any building or land within 100 yards of the site of any intended building who may be himself aggrieved by the grant of such consent in respect of the last mentioned building, or (*b*) any applicant for consent which has been refused.

Thickness and Hight of Walls.

The foregoing would seem to embrace quite a large number of serious difficulties, but it is when we come to consider the first schedule of the Building act of 1894 that we find how closely the law corresponds with tradition of London life. Thus, when the wall does not exceed 25 feet in hight it shall be 8½ inches thick for its whole hight. If it exceeds 30 feet in hight, or comprises more than two stories, it shall be 13 inches thick below the topmost story and 8½ inches thick for the rest of its hight. From this point the thickness increases in regular gradations. Forty feet, 17½ inches thick for the hight of one story, then 13 inches thick for the rest of its hight below the topmost story, and 8½ inches thick for the rest of its hight. For 60 feet high, 21½ inches thick for the bottom story and then 17½ inches and 13 inches for the upper and uppermost stories, and so on for 70, 80, 90 and 100 feet. Where the building exceeds 100 feet the whole shall be 31 inches thick for the hight of one story, then 26 inches thick for the hight of the next two stories, then 21½ inches thick for the hight of the next two, then 17½ for the next three stories and 13 inches thick for the rest of the hight. The tenth clause in the schedule is all important from the point of view of high buildings. It reads: "If any story exceeds in hight 16 times the thickness prescribed under this schedule for the walls of such story the thickness of each external and party wall throughout such story shall be increased to one-sixteenth part of the hight of the story, and the thickness of each external and party wall below that story shall be increased to a like extent, but any such additional thickness may be confined to piers properly distributed, of which the collective widths amount to one-fourth part of the length of the whole." It will thus be seen that legislation in regard to the building of houses is almost entirely based upon the assumption that brick or something similar is the inevitable material to be used. If American structural steel is to come into that use in England for building purposes which one would naturally expect, special legislation must be passed by Parliament.

The Right of Light.

As if the foregoing difficulties were not enough, we are hampered, and seriously hampered, by the right of light, which is not a law in itself, but is a custom indorsed by the law. Judgments have repeatedly been given in the courts supporting the custom of paying for the right of light after 12 years' possession. This question of right of light probably hampers structural steel men as much as the specific law which I have quoted above.

Structural Steel in Cape Colony.

There is a growing demand in the English colonies for structural steel; the latest is a contract secured by Milliken Brothers through their London representative, G. B. Wills, for the erection of the steel work for the Tivoli Theatre, Cape Town. This contract is, in its way, a triumph for America, because the building is to be erected entirely upon the reputation of the contractors. I understand the architect was anxious to have an erection in this country. but in view of the experience which Milliken Brothers are known to possess, this particular proviso was dispensed with and the building will be erected in a few weeks from now by Milliken Brothers from their own designs and upon their own responsibility. I hear of other likely contracts for structural steel buildings in Mexico, Buenos Ayres and Melbourne.

Marine Structural Steel.

Meantime, American makers who are interested in supplying structural steel for marine work should watch carefully the proceedings of the committee which has been appointed by the Government to inquire into the whole question of the strength of torpedo boat destroyers and the methods to be adopted to counteract any weakness that may be discovered. This committee will examine the destroyers which have shown signs of weakening, will carry out experimental tests and if necessary examine witnesses, but the main source of information will be from the Admiralty documents relating to scantlings, weights carried, the distribution of weights, &c. The great shipbuilding establishments on the Clyde are well represented and much will depend upon the conclusions arrived at by this committee. Two additional orders have been placed with the Tyne shipbuilders for steamers for cable laying purposes. These vessels are to be larger than those usually built for such uses, and are to be of good speed. Five submarine boats are being built at Barrow by Vickers, Sons & Maxim, and the announcement is made that the Admiralty in a short time will require a large number in addition. It will thus be seen that, although many difficulties stand in the way of popularizing American structural steel for high buildings in Great Britain, there is apparently no falling off in the demand for marine structural steel. Not only are the naval yards in England busy and likely to continue busy, but orders are shortly to be given out by both the French and German governments. Although, as I say, the demand for structural steel is at present keen, so also is competition. British steel makers are being hard pressed in all forms of steel by German makers. During the past few weeks many thousand tons of German billets have been sold at rates which cannot possibly be touched by English makers.

Ebbw Vale Company Not Included.

With reference to the negotiations and rumors concerning the amalgamation of South Wales iron and steel companies an official writes that there is no likelihood of such an alliance taking place. He adds that as in consequence of these rumors the price of Ebbw Vale shares has risen, he feels it imperative to make this statement, as otherwise he would feel personally guilty having regard to his official knowledge. Mention of these South Wales concerns reminds me that Arthur Keen, who is now almost as well known on your side as ours, is making things hum, both at Dowlais and Cardiff. Several of the leading officials have practically been compelled to send in their resignations, while 50 or 60 foremen, weighers and gaffers and over 500 old hands have received a month's notice. The changes are not expected to end here. New plants on the latest American lines is being laid down, while with the acquisition of the famous Cyfartha Works, so long associated with the name of Crawshay, Arthur Keen is doubtless of opinion that before long he will hold his own with either American or German competition.

The Copper Market.

The feature of the copper market at present is a considerable shrinkage in the European demand. The American exports of copper to this country have been the smallest since 1893. Germany has taken 49,000,000 pounds less, France has decreased her purchases by 26,000,000 pounds and Great Britain by 24,000,000 pounds, the comparative period being the first nine months in the year. Apart altogether from the financial side of the copper problem as it affects the American money market, the influence of the war and other causes are having their economic effect in Europe and Great Britain.

Personal.

Hall & Pickles of Port street, Manchester, have made arrangements with Jones & Laughlins for the exclusive sale of the great Pittsburgh firm's products in England. The arrangement refers mainly, I think, to cold rolled steel and shafting. John Hall, the managing director of this firm, has several times been to America, and has made himself thoroughly acquainted with American methods. S. G. H.

Marconi Stations for Newfoundland.

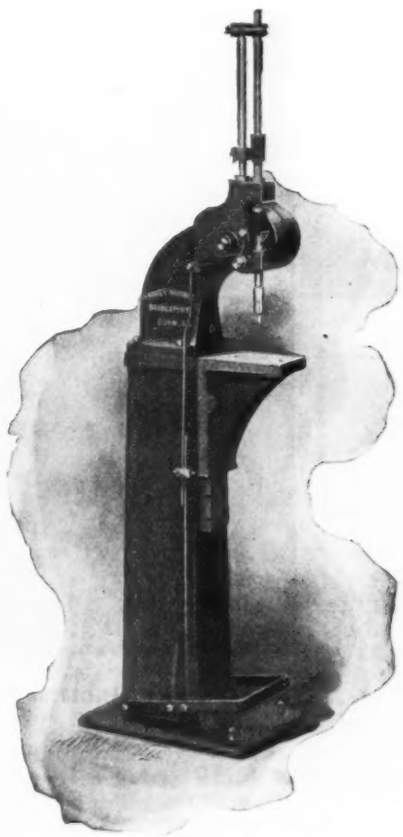
It is announced, states the *Electrical World*, that Mr. Marconi has sailed for St. Johns, Newfoundland, to carry out some experiments in connection with his system. During four weeks following his arrival various localities on the Newfoundland coast will be utilized in turn as stations, as one of the main points which it is hoped will be solved by his experiments is the extent of the influence natural surroundings have upon wireless telegraphic transmission. Weather conditions along this coast are notoriously bad, and electrical disturbances frequent, so Mr. Marconi will in all probability be able to study all the difficulties which at present confront the development of wireless telegraphy. As it would be tedious and expensive work to erect a huge mast at each spot selected for an experimental station, Mr. Marconi takes with him two balloons of 20,000 cubic feet capacity. These balloons will be used to suspend the aerial wire forming the shore station. With balloons it is obvious the experimenter can work with a longer aerial wire than with poles, and it is probable, weather conditions being favorable, that attempts to extend to its greatest distance the working radius of wireless telegraphy by utilizing an additional hight for the wire will be made. Ordinarily the balloons will be kept about 150 feet in the air, but may be used up to 300 feet.

The sea station will be on a steamer, equipped with a pole 120 feet high. This steamer will work off the coast, steaming out to sea as far as communication with the shore station can be maintained. The effect of rocky shores, inclosed bays and fogs will be studied. Electrical disturbances at present form one of the most aggravating obstacles to distinct and uninterrupted communication, as when electric strays come in on the aerial wire mixed up with Morse signals it is impossible to read the tape or sounder. To discover a remedy for this defect also is one of the objects of Mr. Marconi's experiments. The steamer "Lake Champlain" of the Beaver Line, which is equipped with Marconi apparatus, will be communicated with at the longest distances possible during her trips in and out of the Gulf of St. Lawrence. Mr. Marconi speaks of trying to do 250 or 300 miles, but does not promise success.

The first spot where experiments will be made is in the vicinity of St. Johns, on the northern coast lower promontory. There is already a Marconi station at Cape Race, 80 miles from St. Johns, but in order to satisfy himself on these points Mr. Marconi will move his bases of experiments from place to place between Cape Race and St. Johns, at the same time testing the difference in altitudes by comparison with the results from balloons.

The Hubbell Riveting Machine.

The new riveting machine manufactured by Harvey Hubbell of Bridgeport, Conn., will take work up to 3-16 inch. The foot lever is connected with a bell crank,



THE HUBBELL RIVETING MACHINE.

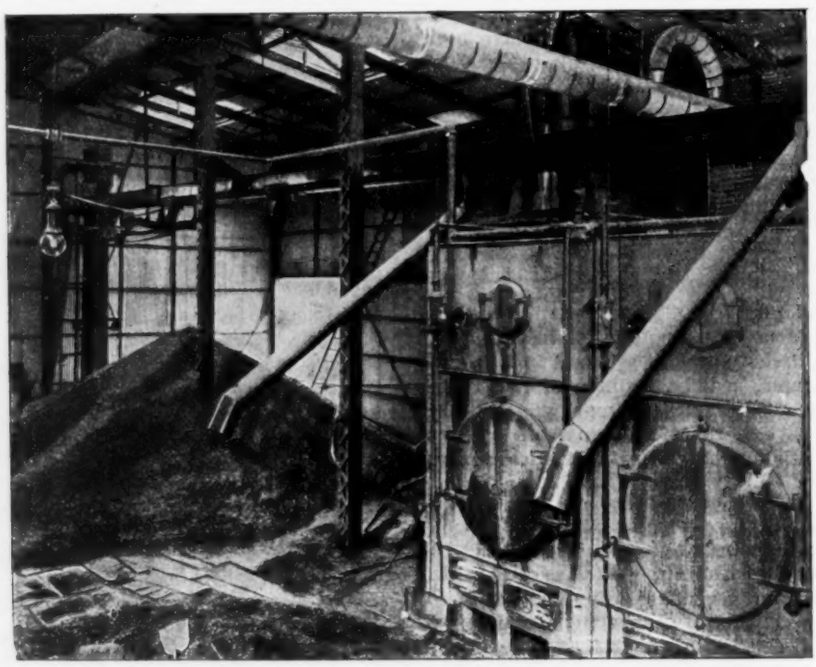
which operates a hardened steel bolt, pushing it under the hammer spindle at the top of the stroke, stopping the machine instantly. The hammer is caused to rotate by a ratchet device that operates on the up stroke. The spindle strikes about 900 strokes per minute. The blow is adjusted by changing the tension spring on the hammer spindle. The table is adjustable by being clamped on a gibbed way, and is rigidly held in place by a piece of metal inserted in horizontal grooves planed in the pedestal, and has no chance to jar down. The weight of the machine with countershaft is about 300 pounds, the hight being 60 inches and the floor space 20 x 12 inches.

The Carnahan Tin Plate & Sheet Company, Canton, Ohio, have not fully decided to build a steel plant in connection with their plate and sheet mills, but the prospects are that they will erect a plant with a capacity of from 1000 to 1500 tons per week. The matter will be settled within the next 30 days.

Coal Handling Machinery for a Small Steam Plant.

Under average conditions a steam plant using 25 tons of coal per day will have one fireman and one laborer to place his coal in front of the boiler for him. Such a steam plant is large enough to warrant the installation of a coal handling apparatus to distribute the coal before the furnace doors, or into automatic stokers, if stokers are used. Coal handling machinery in a plant of this size will render service equal to or better than a laborer, who must be paid from $500 to $600 per annum.

The engravings illustrate coal distributing machinery designed and erected by the Aultman Company of Canton, Ohio, for the Bergdoll Brewing Company of Philadelphia. This plant has 12 boilers fired by hand with anthracite pea coal. A side track is parallel with the end of the boiler room. Coal is received in bottom dump cars and dumped into a hopper beneath the track; from the bottom of the hopper a chute controlled by an automatic discharge gate leads the coal to a bucket elevator located just inside the end wall. This elevator discharges into a 12-inch steel screw conveyor, 65 feet long, operating in a steel trough, placed on the columns of the building 19 feet above the boiler room floor. The front of each boiler is served with coal through discharge gates and spouts placed at proper intervals in the bottom of the conveyor trough, these discharge gates being operated from the floor level. The capacity of the system is 30 tons of coal per hour from car to boiler room, a 6 horse-power electric motor furnishing the requisite power to operate it. The approximate cost of the entire apparatus erected in place is less than $1000.



COAL HANDLING MACHINERY FOR A SMALL STEAM PLANT.

A reserve storage of coal for several days' consumption is stored under cover in the vacant space next to the elevator, which can be allowed to flow back into the elevator boot for distribution by the screw conveyor in the same manner as coal direct from the cars would be distributed. Where gondola cars are used the track hopper is replaced by a shoveling hopper, into which the coal is shoveled from the cars, a chute leading from this hopper into the elevator.

The Mexican Central Railroad Company are equipping some of their locomotives with oil burners, and contemplate extending this fuel throughout their system. By the use of oil it is expected that the operating expense item of fuel, which was over $3,000,000 (Mexican currency) in the last fiscal year, will be materially reduced.

The Barrus Apparatus for Testing Steam Pipe Coverings.

Geo. H. Barrus of Boston has installed, at the Manhattan Railway power house, New York, apparatus for ascertaining the efficiency, both comparatively and absolutely, of some of the leading steam pipe coverings.

The plant is divided into two sections, one for coverings designed to stand the highest pressures which are now regularly carried by the modern power plants, say 150 pounds per square inch, and the other for lower pressures such as have been in vogue for many years past, say 80 pounds per square inch. It was sought to install a testing plant for the purpose in view that should be on a sufficiently large scale to approximate to practical conditions of service, rather than make it a laboratory apparatus and a laboratory test, which characterizes much of the work heretofore done in this field of testing.

The size of pipe selected for the leading tests is the ordinary standard 2-inch steam pipe, and the length selected 100 feet for each pipe. That the effect of size of pipe on the results might be studied and exhibited, and at the same time the work brought into line with the practice of high pressure power plants, especially as regards much of the engine and boiler room piping, two 10-inch pipes, each 35 feet in length, form a part of the 150-pound section of the apparatus. The 2-inch pipes in the 80-pound section of the plant are numbered for reference 1, 2, 3, 4 and 5. The 2-inch pipes in the 150-pound section are designated 6, 7, 8, 9 and 10, and the 10-inch pipes are numbered 11 and 12.

To facilitate the handling of the apparatus and the ready collection and measurement of the water of condensation discharged from the pipes, the steam is first supplied to a central point on one of the long sides of a rectangular room, about 130 feet long and 22 feet wide, and the various pipes lead from this point outward to the two ends of the room and thence after turning they are brought back to points near the center, where the various collecting casks and weighing scales are conveniently located.

The main object, so far as the getting of the principal data is concerned, is to properly secure and measure the water formed by condensation of the steam in the pipes. Precautions must be taken first to insure a supply of

steam to the pipes free from water at the start—in other words, dry steam; second, suitable inclination or pitch of the pipes to insure the drainage of all the water formed by condensation to the drip ends or the points where it is discharged into the collecting casks; third, the thorough venting of the drip ends of the pipes to prevent the collection of air in the interior, and, fourth, the proper collection and measurement of all the water discharged. To secure dry steam at the start, the steam from the boiler first enters the central separator, which is merely a vertical 6-inch pipe, drained at the bottom by a steam trap, the steam entering through a 2-inch pipe at the top which descends inside about 18 inches; the steam, freed of its water, passing off at the two side branches, which are each of the 2-inch size. Before entering either header the steam passes through another separator, which is likewise a 6-inch vertical pipe, drained at the bottom by a ¾-inch valve, the entering steam likewise descending through a 2-inch pipe a distance of about 18 inches, and the dried steam passing off at the side into the end of the 6-inch header. As a further precaution the outer or dead end of either header is drained by a ¾-inch pipe, connecting into the main drain pipe above the valve, and attached to the vertical portion of this pipe is a glass gauge to reveal to the eye any collection of water inside. Beyond all this, a steam calorimeter is attached to the side of either header, the sampling pipe of which draws from the center of the interior space. Starting with dry steam in the headers, which are protected by hair felt and canvas, a supply of dry steam to the pipes is secured by connecting to the top of the header and taking the steam in each case through a 2-inch angle valve. The proper drainage of the water formed by condensation in the test pipes is secured by pitching them from the inlet end to the discharge end. The 2-inch pipes have a total drop from one end to the other of 16 inches. The 10-inch pipes have a total drop of 6 inches.

The venting of air is secured by the attachment of a ¼-inch air pipe to each drip end, at a point about ½ inch above the line of the bottom of the pipe inside.

The drip end of each test pipe is provided with a vertical drain pipe of the ½-inch size, provided at the bottom with a ½-inch globe valve. Attached to the pipe above this valve is a glass water gauge. By means of this glass gauge, which is an all-important appendage to each pipe, a knowledge is had of the exact state of the water condensed in the pipe, and by suitable regulation of the discharge valve the water can be kept drawn down continuously to the desired mark and all the water discharged to the weighing cask as fast as it collects. To facilitate the easy regulation of the discharge water a second discharge pipe of the ⅛-inch size is attached to the drip end of the lower gauge fitting and this is provided with a ⅛-inch globe valve. The main dependence for the discharge of water into the casks is placed upon this pipe, and its outlet descends to within 6 inches of the bottom. That all the water discharged under the pressure to which it is subjected in the test pipe may be recovered without loss of evaporation when the pressure is relieved, the cask is partly filled with cold water at the beginning of a test, and the highly heated water is quickly cooled. Each cask rests on an independent platform scale which reads to ¼ pounds, and the rate of condensation in the pipe for any interval of time, such as a half hour, or an hour, is the increase of weight shown on the scales for that period of time.

The tests have started each morning with pipes empty and pipes and coverings cold. A period of 1½ hours has usually sufficed to thoroughly heat the coverings, and after that time for 7 to 7½ hours uniform conditions as to rate of condensation have prevailed. At the end of the day's run the steam has been shut off from the headers, the pressure allowed to fall, and just before the pressure reaches zero the ⅛-inch drips are blown out and the water remaining in the pipes drained into pails through the ½-inch valves, the pails being subsequently emptied into the casks. All the water resulting from the preliminary heating of the pipes and coverings and the draining of the apparatus at the end is collected and weighed in the casks, in addition to that condensed during the period of normal conditions. Half-hourly observations are made of the weight on each scale, so that the condensation due to the preliminary heating can be separately determined, and the record of the test ascertained for any smaller period desired than the whole day's run.

The temperature of the air surrounding the pipes is shown by thermometers in japanned cases which are suspended 24 inches below the coverings, and distributed in various parts of the room, and the condition of the air as regards humidity is shown by wet and dry bulb thermometers.

The pressure in each of the two sections of the apparatus is shown by the gauges attached near each header, and the temperature of the steam by two thermometers placed in wells which are sunk within. The temperature of the water discharged from the pipes is shown by thermometers in Nos. 1 and 6 discharge pipes. The temperature of the outside surface of the coverings has been found by laying the bulb of a thermoneter alongside the covering and protecting it from outside influence by a thick layer of hair felt tied on. Pans of water well protected by hair felt have also been used, encircling the upper half of the pipe, and their temperature taken.

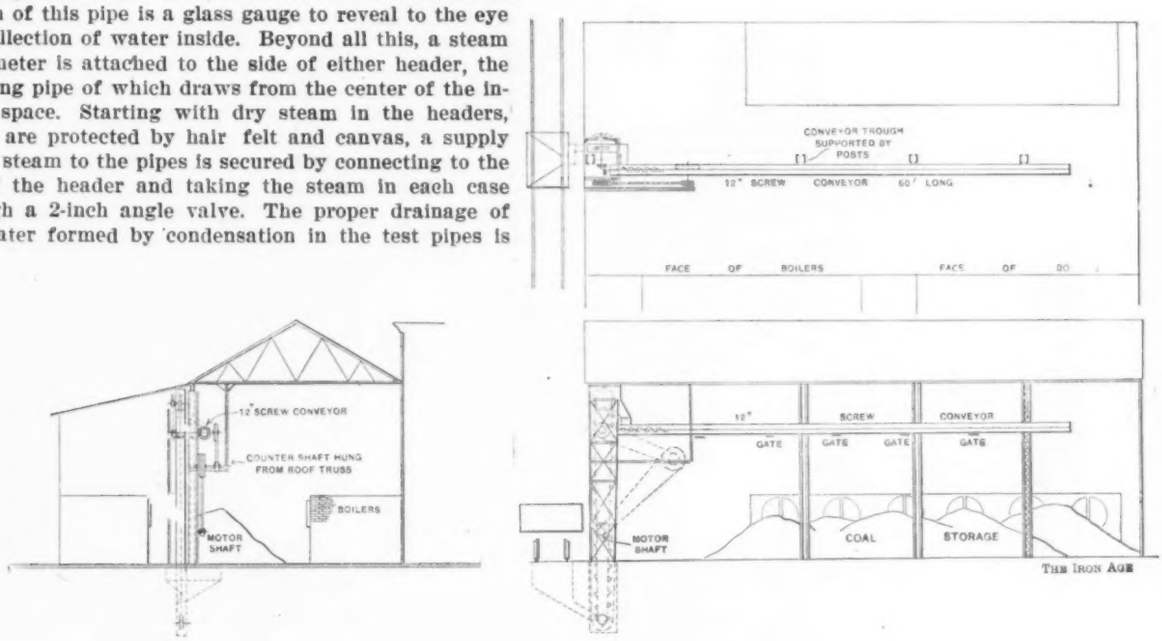


Fig. 2.—Sectional Elevations and Plan.

COAL HANDLING MACHINERY FOR A SMALL STEAM PLANT.

All the various instruments referred to have been observed during the test at uniform time intervals, so as to obtain average records of the attending conditions.

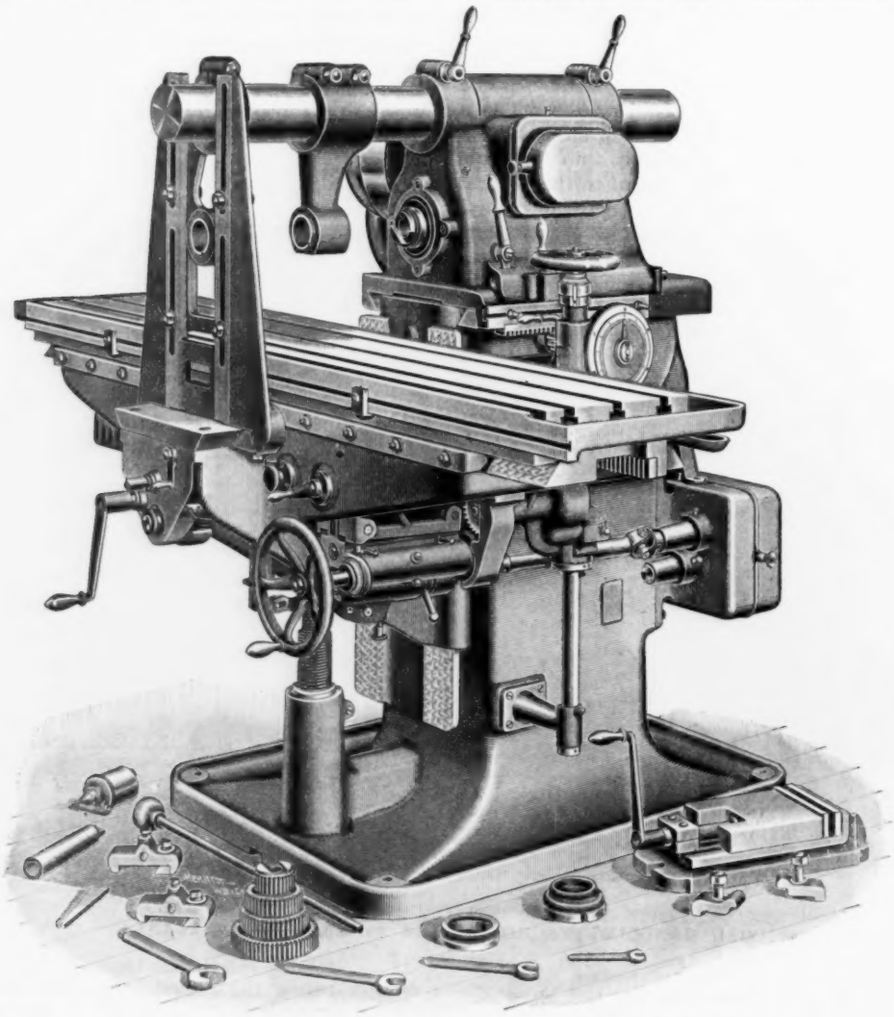
These tests have, as a rule, been made with pipe having dead ends, and with no circulation of steam through the pipe except that required to supply the loss by condensation, and the small amount escaping at the air vent—in no case being in excess of ½ horse-power of steam for any one of either the 2-inch or the 10-inch pipes. To determine whether this method of test is applicable to the ordinary conditions of service where steam is moving through the pipe at a far greater velocity, pipes Nos. 1 and 6 were fitted at their drip ends with steam discharge pipes arranged so as to obtain any desired current through the pipe without carrying away with the steam discharged any of the water condensed. The amount discharged was determined by passing the steam through a horizontal orifice ½ inch in diameter, and maintaining above it a pressure of about 15 pounds by the gauge. This makes a current through pipe No. 1 having a velocity of about 18 feet per second. It was found, as a result of tests made first with no current and then with the steam moving at the velocity mentioned, that the rate of condensation was unaffected, being the same with moving steam as it was with comparatively dead steam, and this was true whether the pipes were covered or bare.

The lowest rate of condensation obtained on any of the 2-inch coverings of the 80-pound section has been a total for the entire pipe of 13.46 pounds per hour, and the highest 15.14 pounds. The lowest on any of the 2-inch coverings of the 150-pound section has been 10.47 pounds per hour, and the highest 14 pounds per hour. The lowest on any of the 10-inch coverings is 10.67 pounds per hour total for the entire pipe, and the highest 15.93 pounds. All these figures apply to the average rate for a period of 7 or 7½ hours continuous run.

The Brown & Sharpe Plain Milling Machine.

A plain milling machine, new in design and known as No. 24, has recently been brought out by the Brown & Sharpe Mfg. Company of Providence, R. I. Several important features that have not been combined before in a machine of this size and capacity are embodied in its construction. This machine is built for work requiring unusually large table capacity and long cuts. Exceptionally heavy gearing is provided, thus fitting the machine especially for the requirements of machine tool builders, engine and railroad shops, and the heavier class of milling in general.

The steel spindle has ground and lapped bearings, and runs in phosphor bronze boxes provided with means of compensation for wear. The spindle is smoothly and powerfully driven by a worm and worm wheel, the worm wheel being made of phosphor bronze, while the worm is made of steel, hardened, and runs in oil. The thrust of the worm is taken by ball bearings. Provision is made for taking up the wear of the worm and wheel, thus insuring proper contact and the smooth running of the spindle. The spindle cone runs idle and in the same direction as the shaft on which it is mounted, thus reducing the friction to a minimum. It has only two steps, the power being transmitted through a system of gearing arranged to give an exceptionally high ratio.



THE BROWN & SHARPE PLAIN MILLING MACHINE.

The changes of spindle speed are obtained by means of transposing gears. With two speeds of the countershaft eight changes are obtained, varying from 15 to 100 revolutions per minute. The advantages of this method of driving are readily appreciated, as the speed of the spindle cone is maintained more uniformly than when the changes of speed are wholly dependent upon the number of steps on the cone and the power is not reduced to such an extent when slow speeds are required for heavy cuts.

The method of clamping the spindle head and knee

is improved, each being clamped by one lever in place of two as formerly. This will tend to show the care and attention given throughout to the details of convenience in the manipulation of the machine. The overhanging arm is of steel and can be pushed back from over the table when not in use. The arm support is exceptionally rigid and of improved design. It is made in two parts, clamped directly to the front of the knee, and can be easily placed in position or removed. The two parts slide upon each other and are clamped in position by bolts passing through the slots. This form admits of a bearing for the outer end of the arbor directly in the support and allows the adjustable arbor support to be used at any intermediate point on the arbor, thus giving an exceptionally rigid support for the arbors.

The table is supported directly in the knee, which is unusually long for the capacity of the machine. It is often desirable to mill work requiring large table capacity, and this feature of the long knee, which affords opportunity for long table bearings, can readily be appreciated for work of this character. Another important feature to be noted is that the table remains locked in position when the feed is automatically thrown out.

The knee or elevating screw is of the telescopic form. This does away with the necessity of providing a hole in the floor to receive the screw, as is usual in milling machine practice.

The feeds are smoothly and positively driven by chain and sprocket wheels, the various changes being made by means of change gears. They are automatic in all directions and are provided with safety stops.

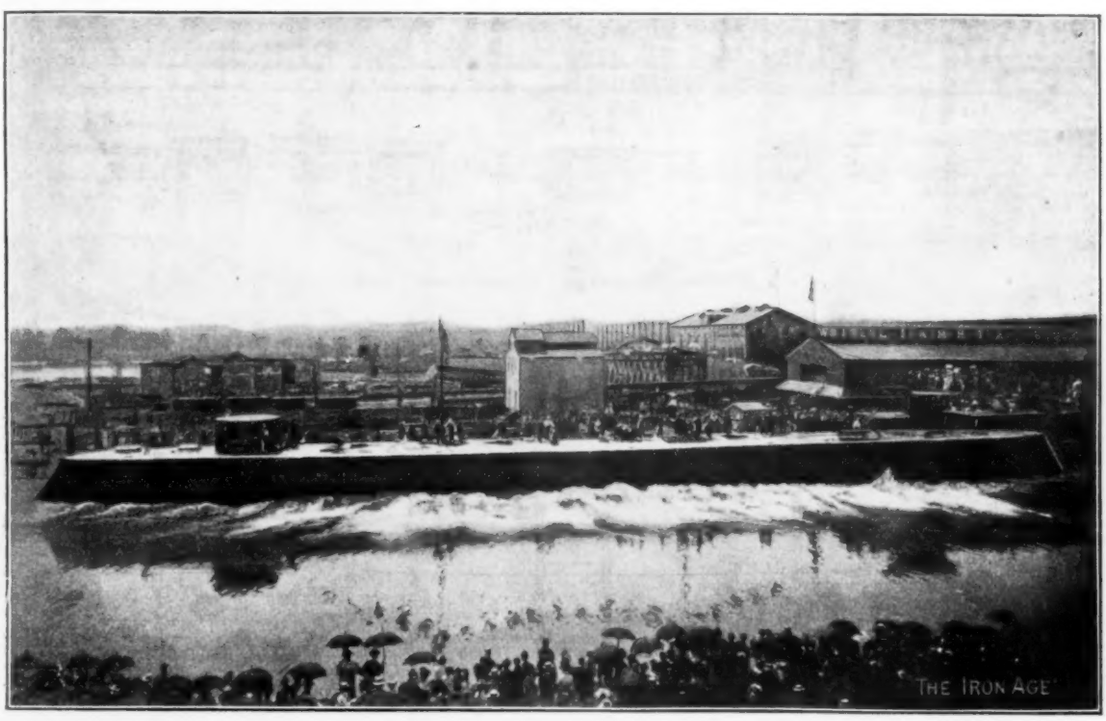
The distance from the center of the spindle to the under side of the overhanging arm is 7¼ inches and the greatest distance from the end of the spindle to center in the arbor support is 26½ inches. The table has a working surface of 72 x 17¼ inches and can be lowered 19 inches from the center of the spindle. Milling can be done 22½ inches from the face of the column. The simplicity of this drive is an important feature. The object has been to secure as direct a transmission of power as possible at the least loss and at the same time provide for a wide range of feed changes. The power for this drive is taken directly from the main spindle and carried by chain and sprocket wheels to the change gears, thence to the table feed rack through a universal shaft, worm and worm wheel. It is apparent that a drive of this character insures a positive, uniform and steady feed for the table. Any lost motion that may occur can be easily compensated for by taking up the slack of the chain.

Adjustable dials, graduated to read to thousandths of an inch, indicate the longitudinal, transverse and vertical movements of the table. A dial, graduated to read to sixty-fourths of an inch, indicates the transverse movement of the head. The dials can be adjusted without the aid of wrench or screw driver.

Side Launch of Torpedo Boats and Torpedo Boat Destroyers.*

BY ASSISTANT NAVAL CONSTRUCTOR W. G. GROESBECK, U. S. N.

Although side launching on the lakes is not an uncommon practice, and the members of this society are doubtless familiar with the details thereof, the side launches described in this paper present some novel features; and while the necessity for launching torpedo craft sideways may not again occur, a record of what has been done may be of interest, if not of value, to the members of this society.



"Decatur."

SIDE LAUNCH OF TORPEDO BOATS AND TORPEDO BOAT DESTROYERS.

This paper describes the launching of torpedo boats "Shubrick," "Stockton" and "Thornton," and of torpedo boat destroyers "Dale" and "Decatur," all of which were built by the William R. Trigg Company, at Richmond, Va.

Before proceeding with the subject matter of this paper it may be proper to remark that these vessels were not launched sideways from choice; on the contrary, the limited extent of land and water available at the time these vessels were laid down left the Trigg Company no alternative. The land at their disposal was a wedge shaped piece of ground, bounded on two sides by the old James River and Kanawha Canal and by the dock at the head of the same, and on the third side by the tracks of the Chesapeake & Ohio Railroad and of the Southern Railway. The canal is about 100 feet wide and is normally about 15 feet deep, although this was

* Abstract paper read at a meeting of the Society of Naval Architects and Marine Engineers.

increased by flooding during the launches to about 18 feet. The "Shubrick's" building slip occupied the apex of the wedge, and the "Stockton" and "Thornton" and "Dale" and "Decatur" were built in pairs in the order named. It may also be remarked here that the vessels were launched in the order in which they have been mentioned above. The "Shubrick," "Stockton" and "Thornton" are sister vessels, as are the "Dale" and "Decatur."

It may be said that in general the methods used for the two classes, torpedo boats and destroyers, were the same, with certain necessary variations. In order to make this article as brief as possible only the launchings of the torpedo boats have been described in full. For the destroyers mention of the variations has been made. For the same reason, in the plans accompanying this description, reference to the "Shubrick" has been omitted, because the arrangement of the building slip and launching ways was exactly similar in her case to those used for the "Stockton" and "Thornton." The keels were laid horizontal and parallel to the edge of the canal.

The groundways were of 12 x 12 inch yellow pine and were eight in number, the inclination being 2 inches to 1 foot. This, I believe, is about the inclination of the groundways used on the lakes for side launches; but this is about the only point in which there is any resemblance between the methods adopted on the lakes and for the vessels under consideration.

For the boats (torpedoes) under discussion the eight groundways were arranged in four groups of two each. The two members of each group were 15 feet apart, and the cradles were built up in the form of rigid rectangles, the sliding ways being parallel to and resting on the groundways throughout their length. They were kept from slipping off the groundways by shoes similar to those used in ordinary end on launches. With this arrangement it was, of course, very important that both ends of the vessel should start at the same time, as, if one end were to gain a decided start over the other end it might happen that the sliding ways would ride up over the groundways and slip off, or, as an alternative, the cradles might be broken up. So far as I can see the method adopted by the Trigg Company possesses no decided advantage over the method used on the lakes, and I believe that in future launches the Trigg Company propose to make their practice conform to the lake practice. It is proper, however, to remark that had the Trigg Company used the lake method in the case of these boats, whose ratio of beam to length is about 1 to 10, the groundways would have had to be increased in number, and the expense of the launching would have been correspondingly increased. As will be seen later on, there was some little trouble in getting both ends of the vessels to start at the same time, but there never was enough difference between the times of the starting of the two ends to materially affect the success of the launch.

The second point of difference mentioned above is found in the length of the groundways and the relative positions of their ends with reference to the water line. In the case of the "Maunalon" (launched on the lakes)

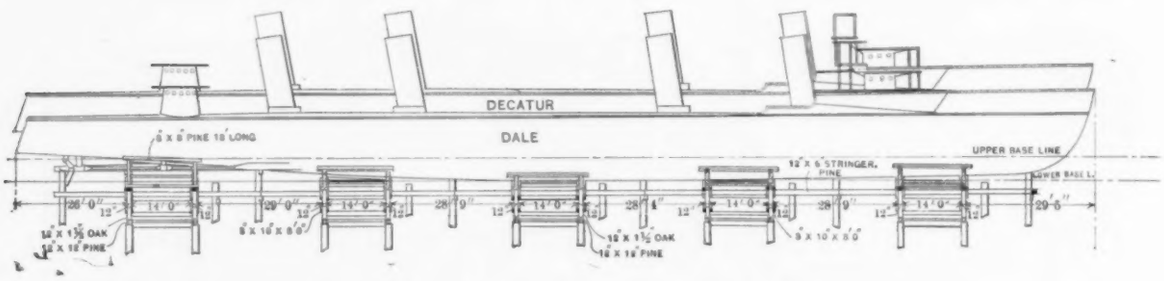


Fig. 2.—Side Elevation of "Decatur" and "Dale."

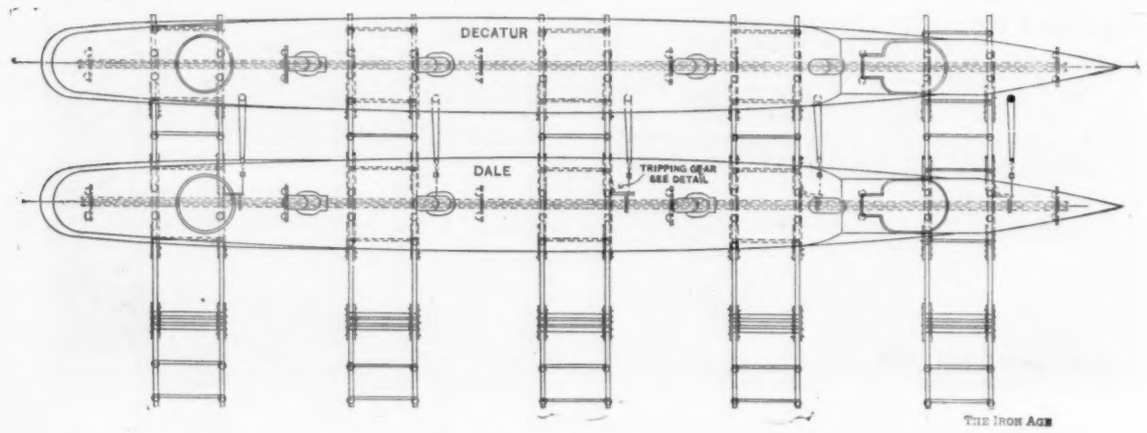


Fig. 3.—Plan.

SIDE LAUNCH OF TORPEDO BOATS AND TORPEDO BOAT DESTROYERS.

the groundways ended on the water's edge and were rounded off. The effect of this is that the vessel turns over slightly on her bilge in launching and drops off the ways, if I may be allowed to use the expression. The groundways for the torpedo boats were carried down well under the water. The boats were thus entirely water borne before leaving the ways and floated off. I do not know that carrying the ways down under the water was absolutely necessary. But as it saved some strain on the hull during launching, the precaution taken is considered to have been distinctly worth while; and as it was possible to lower the water in the canal sufficiently to do the entire work above water, the extra expense was not great.

Of the cradles themselves it seems to be necessary to say very little, as they are shown by the drawings in sufficient detail to enable them to be readily understood. Nor do the wedging up and preparations for launching seem to call for any special comment, as they were carried on in exactly the same way as they would have been for an end-on launch. The releasing devices were four, one to each cradle. This apparatus, Fig. 7, was put in place just before launching, and as much strain as possible was set up in the trigger rope by means of

a four-fold tackle, which was then belayed. After wedging up and removing the blocking the vessel was held in place by the four trigger ropes. To launch it was only necessary to cut the four trigger ropes simultaneously. An ordinary 12 x 12 inch pine ram was ready on each groundway at the upper end of the cradle for use in starting if necessary.

In the case of the two destroyers to which the drawings here reproduced particularly refer, there were five sets of groundways instead of the four used for the boats, and the scantlings used in the cradles were in general somewhat heavier. There were five cradles instead of four and five sets of triggers. Other minor differences were made necessary by the larger dimensions and launching weights of the destroyers.

In the accompanying table the particulars as to the weights of the "Shubrick," "Stockton" and "Thornton" are detailed. For the "Dale" and "Decatur" the weights are so nearly alike that it is not worth while to differentiate them. The figures given are for the "Dale."

Preparation for Launching.

In all the launchings a preparation of 1 pound No. 2 Albany grease to 5 pounds of beef tallow was used. The grease was boiled three hours and then mixed with the melted tallow. After application to the ways the surface was covered with lard oil. In very warm weather the proportion of the mixture was altered by the addition of 5 pounds more of beef tallow, which was put in after the original stock mixture had been heated.

As it was not considered safe to launch them from a position so far from the water, it became necessary, after launching the "Stockton" and "Dale," to lower the "Thornton" and "Decatur" to the positions previously occupied by their sister vessels. The means employed were similar in both cases, and are illustrated in Fig. 8. As the only difference between the operations on the "Thornton" and "Decatur" was in the number of jacks employed, there being one for each groundway, a description of the method used on the "Thornton" will be sufficient.

The groundways were bored throughout with sets of two holes each, for 1-inch bolts. Eight 12 x 12 inch by 4-foot blocks of yellow pine were prepared, and holes drilled in them to correspond with the holes in the groundways. The holes in the groundways were so arranged that the pine blocks could be shifted down about 24 inches at a time. There being one jack for each groundway, there were two on each cradle, and the positions of these two were so arranged that one was always about 12 inches in advance of the other. The jacks used were 8-ton screw jacks. The operation of lowering needs but little description. All the jacks being in place and set up the vessel was wedged up and the blocks removed, as for launching. The jacks were then backed down until the four nearest the cradles could go no further. The lowering was stopped and the jacks removed; the blocks were then shifted back 24 inches, the vessel being held in place by the other four jacks. The jacks were then replaced and the lowering was continued until the other set of jacks had to be shifted back, and so on. The operation was slow, but entirely successful. The total traverse in the case of the "Thornton" was 30 feet, and in the case of the "Decatur," 32 feet.

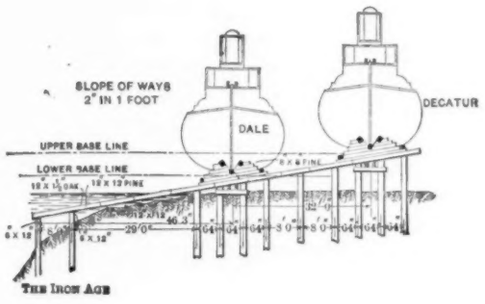


Fig. 4.—Bow View.

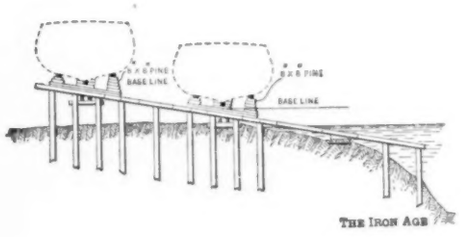


Fig. 5.—Center Section.

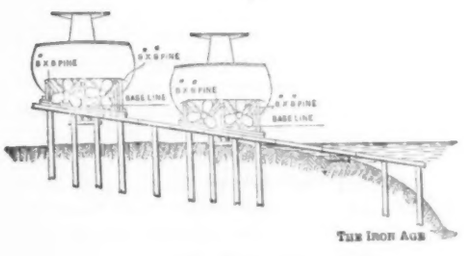


Fig. 6.—Stern View.

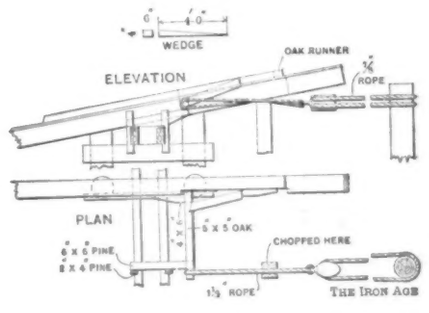


Fig. 7.—Tripping Arrangement.

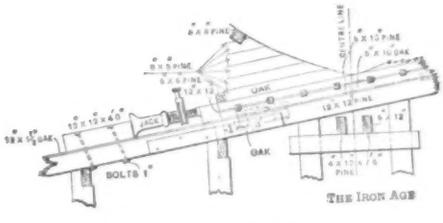


Fig. 8.—Lowering Arrangement—One Jack on Each Ground Way.

SIDE LAUNCH OF TORPEDO BOATS AND TORPEDO BOAT DESTROYERS.

Launching.

Having now gotten all our vessels ready for launching, a few words as to the actual launching of the several ships will properly bring this article to a close. I regret that at the time of these launchings the preparation of this article had not occurred to me, and I am therefore compelled to rely on my memory, as I took no notes. The record would have been, however, about as follows:

"Shubrick," October 30, 1899; raining, warm. Vessel launched without shafting, rudder or propellers. Rather slow in starting and rams had to be used. Entirely successful.

"Stockton," December 27, 1899; clear and cold. Shafting, propellers and rudder in place. Grease very hard and vessel was very slow in starting. Did not start until after continued application of the rams.

Stern started first and gained about 6 feet start of the bow. Forward cradles strained and some of the fastenings started. There was no damage to the hull.

"Thornton," May 15, 1900; clear and warm. Conditions the same as for the "Stockton," except that about 23½ tons of pig iron was put in forward compartment to counterbalance the weight of shafting, &c., and to equalize and increase the pressure on the ways. Launch entirely successful. Rams unnecessary.

"Dale," July 24, 1900; clear and very warm. About 20 tons of pig iron in forward compartment to equalize the pressure on the ways. Launch entirely successful. Rams unnecessary.

"Decatur," September 26, 1900; clear and very warm. Conditions as to ballast same as for "Dale." Launch was entirely successful, except that through a mistake of the axe man at the midship trigger this trigger rope was not cut with the others. The vessel started immediately, however, without the use of the rams, and tore out the midship trigger device. The vessel started so quickly that the delay due to the midship trigger rope not being cut was not noticeable, and the fact was only discovered after the launch was over.

Table of Launching Data.

	"Shubrick."	"Stockton."	"Thornton."	"Dale" and "Decatur."
Groundways	12 x 12 inch yellow pine			12 x 12 inch yellow pine.
Groundway shoes	12 x 1½ inch oak			12 x 1½ inch oak.
Sliding ways	4¾ x 9¾ inch oak			5½ x 12 inch oak.
Sliding ways, length	16 feet			23 feet.
Inclination of ways	2 inches to 1 foot			2 inches in 1 foot.
Number of ways	8			10.
Number of cradles	4			5.
Number of triggers	4			5.
Bearing surface	103 1-3 square feet			230 square feet.
Launching weight	58 tons	64.62 tons	88.15 tons	193 tons.
Presure per square foot	00.56 tons	0.625 tons	0.853 tons	0.839 tons.
Drafts after launch:				
Forward	8½ in	6 in	1 ft. 10 in	1 foot 10½ inches.
Aft	6 ft	6 ft. 6 in	6 ft. 3¾ in	7 feet ½ inch.
Mean	3 ft. 4¼ in	3 ft. 6 in	4 ft. ⅞ in	4 feet 5½ inches.
Length over all	175 feet			245 feet.
Beam	17 feet 7½ inches			23 feet.
Depth	12 feet 1 13-16 inches			14 feet 3 inches.
Draft	4 feet 8 inches			6 feet 6 inches.
Designed displacement	170 tons			420 tons.
Designed I. H. P	3,000			8,000.
Boilers, Thornycroft	3			4, Daring type.
Total grate surface	137 square feet			315 square feet.
Total heating surface	7,550 square feet			17,768 square feet.
Steam pressure at boiler	250 pounds			300 pounds.
Twin screw engines, 4-cylinder triple expansion	Cylinders 14 x 22 x 25¼ x 25¼ inches, stroke 18 inches			Cylinders 20½ x 32 x 38 x 38 inches, stroke, 22 inches.
Speed, estimated	26 knots			28 knots.

The engraving shows the "Decatur" just as she took the water. The three torpedo boats launched had only sufficient impetus to carry them about 30 feet from the water's edge, while the two destroyers were carried about half way across the canal. No snubbing lines were used, although lines were fitted to hold the vessels from the banks of the canal after the launch was over and for convenience in handling.

Carnegie Wage Scales Unchanged.

No change will be made in the existing wage scales of the employees of Duquesne steel works and blast furnaces, Homestead steel works, Edgar Thomson steel works and blast furnaces, and Upper and Lower Union mills of the Carnegie Steel Company. Under the scale contracts existing between the Carnegie Company and their employees at least 90 days' notice must be given by either side before a change in the wage rate can be made. The time for this notice to be given expired on September 30 last, and as neither side sent in notice to the other, the same wage rate will prevail at the different Carnegie works during 1902 as in this year. Last year, prior to September 30, the Carnegie Company gave notice to their employees that the wage scale would be terminated on September 30, 1900, and it was understood to mean that a reduction in wages would be made. The steel trade at that time was quite dull and prices were declining. However, about December 1 the steel business commenced to improve, and when January 1 had come there was so much betterment in trade that the Carnegie Company reconsidered their action and made no change in the wage scale.

Scotch Pig Iron and Iron Ore Problems.

GLASGOW, November 15, 1901.—A decline in the price of steel ship plates is a natural result of the lowering prospects in the shipbuilding industry. But it is more directly, perhaps, the result of German competition, inasmuch as our producers are still tolerably full of work in respect of the ship contracts on hand. That seems evident from the fact that notwithstanding the two adverse influences mentioned the drop in prices as yet is only 5 shilling per ton. British, and especially Scotch, iron and steel manufacturers contend that they ought to be receiving higher and not lower prices, considering the cost of crude iron, the sustained price of coal and the high level of wages; but they recognize that it is useless to attempt to get more in face of the German and Belgian competition and of the prospective reduced consumption at home.

Some journalists have commented with wonder on the fact that we are both sending pig iron to and receiving pig iron from Germany. A vessel which went with iron from the Forth to Stettin, in North Germany, brought back a cargo of iron to the same port. But these cross currents are no novelty in trade. Last year, while we imported 94,282 tons of pig iron from the United States, we also sent 44,904 tons over to your ports. This year, in the ten months ending October, we received 29,903 tons from and sent 5208 tons to America. Then with regard to Canada—the latest development. Up to this point Glasgow has received 30,000 tons of pig iron from Sydney, Cape Breton, and has about 20,000 tons still to receive on contracts before the end of the year. Yet a steamer which came in the other day with pig iron from Sydney has just gone back with a return cargo of Scotch pig iron. Of course there is pig iron and pig iron, and these cross movements are interesting—nothing more. At the same time the imports from Canada are regarded with a very different eye to those from Germany. On this point these seems to be a wrong impression on your side. The trade here is not at all overturned (as has been suggested) by the erection of four blast furnaces by the Dominion Iron & Steel Company. That in itself is a [illegible] in comparison with the magnitude of the pig iron trade. And it is quite well understood that if and when iron and steel manufacturing is in full swing in Nova Scotia there will be nothing to spare for export of the producing capacity of the present furnaces. But what the far seeing recognize is that this small plant in Cape Breton is but the beginning of what may be a revolution in the iron industry by the shifting of the center of the industry.

Future Supplies of Ore.

The most pressing problem of the trade in Europe is with regard to the future supplies of ore. In Scotland

the rich "blackband" ore, which gave us the start in the trade, is gone, and for common iron ore we have nothing but "clay band" to work upon. Last year only 849,031 tons of iron ore were mined in Scotland—a mere nothing to the quantity of pig iron we produce. We imported, therefore, 1,457,049 tons, chiefly from Spain, and supplementing this with the purple ore residue of cupreous iron pyrites, forge cinders, &c., we had 2,562,926 tons of material for our blast furnaces. The product was 1,156,885 tons of pig in Scotland, which is, roughly, about 2¼ tons of ore to the ton of iron smelted. The Scotch ore used yielded just 254,607 tons of iron, which is to say it is 30 per cent. ore. The Spanish ore formerly imported used to yield 52 per cent., and some of it still does, but a good deal of what we now receive yields no more than 45 per cent., and often much less. Three of our leading firms of ironmasters have mines of their own in the South of Spain which yield an ore of higher percentage. These ores do not come on the market, being brought in here for the consumption of the owners, but their yield improves the average percentages of the Scotch furnaces.

Now to look further afield. The largest ore producing area in England is in North Yorkshire, generally known as Cleveland. The output there last year was 5,493,733 tons (or 119,000 tons less than in the previous year) and it is a 28 to 30 per cent. brown ore, suitable only for the production of common iron. Next came Lincolnshire, with 1,924,898 tons; Northamptonshire, with 1,622,239 tons, and Staffordshire, with 1,084,797 tons—all from ores averaging about 33 per cent. The only red hematite ore in these islands is found in the counties of Cumberland and Lancashire. It averages about 52 per cent. of iron and the output last year was 1,733,791 tons. There are some smaller producing districts, but, to sum up, the total quantity of iron ore mined in the United Kingdom was 14,028,208 tons, as compared with 14,414,330 tons in 1899 and with 14,176,938 tons in 1898. It has been larger (as, for instance, in 1882, when 18,031,957 tons were mined), but that was before the great demand for steel making iron. Now last year there were smelted in the United Kingdom 8,959,691 tons of pig iron, and to obtain that 22,100,774 tons of material were used in the furnaces. That included purple ore, cinders, &c., and it also included 6,297,963 tons of foreign ore imported, besides what stocks of foreign ore remained over from the previous year.

Where did that ore come from? See the following table:

Imports of Iron Ore into United Kingdom.

From—	1899.—Tons.	1900.—Tons.
Algeria	231,361	141,624
Australasia	11,506	5,341
Canada	14,918	4
France	38,274	48,165
Greece	319,759	304,648
Italy	94,771	88,532
Spain	6,186,022	5,551,559
Sweden	105,193	98,055
Turkey	11,950	8,061
Other countries	40,824	51,974
Totals	7,054,578	6,297,963

It will be seen from the above that notwithstanding the great demand and the high prices paid for ironstone last year the imports from abroad fell off by 756,625 tons. The general and confident expectation was that the high prices current would stimulate production in new districts of Spain and in other countries. Yet there was a decline nearly all along the line, and what increases there were from one or two countries were quite insignificant. Our next largest sources of supply after Spain are Algeria and Greece, and last year they failed to respond to our needs. This year they are doing a little better. Our total imports from countries other than Spain in the ten months ending October 31 were 661,229 tons, as against 644,159 tons in the corresponding portion of last year. But Spain has again fallen off, her contribution for the period being only 3,944,403 tons, as against 4,709,995 tons.

Yet ore is very high in price compared with the normal range of prices, and, although so much poorer in quality and in spite of abnormally cheap freights, is costing our smelters so much that they declare it to be impossible to reduce the price of pig iron, which consumers again say is far too dear for a falling market in finished material. The extent to which the assurances that the high price of ore would stimulate production all over Europe are being fulfilled is shown by the figures I have given. Our entire imports from all countries other than Spain are a mere trifle. What we get from Spain is practically all (except the produce of the special mines above referred to) from Bilbao and the Biscayan provinces. The output there is falling off year by year, and this year will probably be 1,000,000 tons short of 1900, although the price is double what it was a few years ago. There is at present no other source of supply presenting itself to take the place of Spain except Nova Scotia. And that is why we in Scotland are so much interested in the developments there. What we shall have presently to decide will be whether to take our furnaces over there or bring the ore over here. A cargo of Newfoundland ore is even now discharging.

The Coal Question.

The coal question would again have assumed an acute form by this time but for the increasing exports of American coal. These shipments from your side have caused both our middlemen and our foreign buyers to hold back, in the certainty that lower prices must result, and this holding from the market has completely stumped the Welsh miners, who hoped, by taking a series of weekly holidays, so to restrict the output as to cause a scarcity and thus uphold prices. They have restricted the output, but they have not caused a scarcity, and they have driven a number of orders to the North of England. Scotland is at present out of the running in the coal export trade, as Scotch coal is for the moment the dearest coal in the country. But when current contracts are worked off there will be a considerable drop. Meanwhile the wages question sleeps. B. T.

From the time the plant of the Youngstown Iron Sheet & Tube Company, at Youngstown, Ohio, was originally projected, it was their intention to build an open hearth steel plant to supply their own steel and make them independent of the open market. Recently the directors of the company increased the capital stock $1,000,000, and this money will be used for the building of a basic open hearth steel plant, to furnish steel for the new tube and sheet mills, which they are building. Detailed plans of the new plant are being prepared and work will be started in a short time. It is likely the new steel plant will be ready by the latter part of 1902. The new sheet mill of the Youngstown Iron & Sheet & Tube Company is rapidly nearing completion, and will be ready for operation within 60 to 90 days.

An important decision has just been rendered by Judge Wing in the Circuit Court of the Northern District of Ohio, sustaining the validity of two patents on drill grinding machines owned by the Worcester Polytechnic Institute, and under which the Washburn shops of the institute are manufacturing. These patents cover important devices essential to the efficiency of drill grinding machinery, and this decision is of great interest to manufacturers of this class of machinery and to the trade generally. A suit is now pending against other parties who have been manufacturing grinders.

N. & G. Taylor Company of Philadelphia, Pa., are making extensive additions and improvements to their works. They are building another mill at Cumberland, Md., which will give them eight mills. They also have other improvements in contemplation there. At their tin plate works in Philadelphia they are making extensive alterations and building a very large warehouse, fully equipped with electrical elevators for the rapid handling of their product. The box department and the black plate department are also being enlarged and another story added to this building. They are also enlarging their smelting works to meet the great demand for their fine makes of solder, babbitt metals, &c.

The Early History of Open Hearth Steel Manufacture in the United States.*

BY SAMUEL T. WELLMAN, CLEVELAND, OHIO.

The Inception of the Process.

In choosing a subject on which to address you tonight, it occurred to me that I could not do better than to take as a topic, "The Early History of Open Hearth Steel Manufacture in the United States." I am led to do this, first, because I was directly and intimately connected with several of the works where the manufacture was first carried on, and hence can speak from personal knowledge, and, secondly, from the fact that very little has been heretofore written in regard to this pioneer work. It has seemed to me that you might possibly be interested in a short statement of the facts in regard to the starting of this branch of the steel trade in America, which, beginning in so small a way, is now fast becoming the most important line of the trade.

Before taking up the subject in detail, a few facts as to the inception of the process in Europe may not be out of place. The idea of making steel by an admixture of cast and wrought iron melted together on the open hearth in a reverberatory furnace was first proposed by the French philosopher, Reaumur, in 1722. We have records of this process being tried several times by different persons during the eighteenth and first half of the nineteenth century. In France, a commission appointed by the French Government under Louis Napoleon spent a large amount of money in experiments in trying to melt steel on the open hearth of a reverberatory furnace. They succeeded in reaching the necessary temperature, but all of these early experiments failed to be a commercial success, on account of the destructive action of the heat on the lining of the furnace. The heat was obtained only by intensely rapid combustion of coal or coke, which created such a cutting action on the brick work that the furnace burned out in a very short time, and the quantity of fuel used was so enormous that the process was always a failure from a commercial standpoint.

The melting of steel in regenerative open hearth furnaces was first proposed by C. W. Siemens in 1861. It was tried in a very small way, by one or two of his licensees, but we have no record of its having been put into successful use. Pierre & Emile Martin, at the Sireuil Works, near Paris, were the first to carry out the process on a commercial scale, they having built a furnace at their works in 1864, under a license from Siemens. Speaking of this furnace, C. W. Siemens, in a paper read before the Chemical Society, May 7, 1868, said: "It was chiefly intended for a heating furnace, but was so constructed of Dinas silica brick and of such form that it could be used as a melting furnace."

Messrs, Martins' experiments with this furnace were quite successful, and soon became known all over the metallurgical world, creating a great deal of interest.

Cooper, Hewitt & Co.'s Experiments.

Among the many ironmasters who became interested in the process was Abram S. Hewitt, who purchased for his firm, Cooper, Hewitt & Co. of Trenton, N. J., the rights in the patents for America. Fred. J. Slade, their engineer, was sent over to France to study the process. When he returned home Cooper, Hewitt & Co. immediately started to erect a small furnace at their works in Trenton, N. J., to try the process. This furnace was of only 4 or 5 tons capacity. It was put in operation during the fall of 1868. The gas producers were of the regular Siemens type, and built from drawings furnished by Messrs. Siemens' agents in America. I was at the time assisting Messrs. Siemens' engineer, J. T. Potts, who had been sent to this country by C. W. Siemens to have charge of the erection and starting of the first regenerative furnace which was built in this country. This furnace was for the melting of crucible steel, and was built at the works of Anderson, Cook & Co. of Pittsburgh, Pa. I was sent by Mr. Potts to Trenton to assist Mr. Slade in the starting of their gas producers, with which they were having some trouble. This gave me a good opportunity to see the first efforts to make open hearth steel, and I have a very vivid recollection of some of these experiments.

Mr. Slade was the only man connected with the works who had ever seen a heat of open hearth steel melted, and, as he was not a practical steel man, he probably overlooked some of the important points while watching the manufacture in France. At any rate, everything bad that could happen in the manufacture of open hearth steel seemed to fall to their lot. The best man among the workmen was the melter, who had been an old puddler, or heater, but of course he was unaccustomed to such high temperatures as were necessary to melt mild steel. The first trouble they encountered was the making of good gas. This arose from a too literal interpretation of the printed instructions for running the producers, which had been sent them by Messrs. Siemens' agents.

When I took charge of the producers I found they were full of coal to the very top, some 6 or 7 feet deep; so thick a fire that about all the heat in the bottom of the producers could do was to drive out the moisture from the upper layers. Water and thin tar were running out of the joints through the whole length of the gas flue, or cooling tube, which was of wrought iron plates, placed above ground. We ran the producers for two days without charging any coal. After about 24 hours' work the producers began to do good service, and we had no further trouble with them. The only difficulty was to get men to faithfully attend to the making of the gas. It is a very disagreeable job, and one that demands constant watchfulness in order to get the best results.

Before trying to describe the melting of the first heats, a word or two about the furnaces and the method of casting. The furnace was a Siemens regenerative furnace, I suppose copied from one in use at Messrs. Martins' works, near Paris. It had a very flat, shallow bottom, but there did not seem to be much trouble in getting it up to a fair steel melting heat. The regenerators seemed to be of ample size, and the furnace fairly well designed for its work, excepting in the shape and depth of the bottom, which was entirely too shallow for the quantity of steel which it had to hold. On the casting side of the furnace, in front of the tapping hole, was fastened a kind of forehearth, called by the workman, from its shape, "a shoe." In the bottom of this, at the outer end, was placed a fire brick nozzle, in which was fitted a fire clay stopper, by which the flow was regulated. Running parallel with the front of the furnace was a line of narrow gauge railroad, on which were placed the cars for the ingot molds, which were arranged for group casting. These cars were moved by a chain windlass placed at one end of the track. In all the heats that I saw made franklinite pig iron was used for the bath, and the balance of the heat made up from puddled bars and scrap steel. This mixture should have made good steel, but unfortunately they had no ferromanganese, none being made at that time in this country and but little, if any, in Europe.

For recarbonization they used a small quantity of franklinite pig, according to my recollection not more than 1 to 1½ per cent. of the weight of the charge. As the franklinite contained only about 10 per cent. of manganese, this gave them a steel very low in that element, with, at the most, not more than 0.015 per cent., and often only a mere trace. The result was a steel that was difficult to roll, except at a high temperature. It would stand a welding heat, and a dull red heat, but was yellow short, and any attempt to hammer or roll it at that temperature resulted in the steel going to pieces. If the furnace bottom has been made of magnesite or other basic material the amount of manganese would have been quite sufficient to have made the steel workable at all temperatures.

In the first heat at Trenton, when the melter thought from the small test ingots taken that the metal was ready to cast, a small quantity of spiegeleisen was added, and when this was melted a bent bar was driven through the sand wall between the shoe and the fur-

* Presidential address before the American Society of Mechanical Engineers.

nace. When this bar was withdrawn it allowed the steel to run out and fill the shoe to the level of the steel in the furnace. The stopper being opened, the steel ran out through the nozzle into the molds. When the first group was filled the stopper was closed, and the car was moved along until the next group came under the nozzle. In this manner about one-half of the molds were filled, when the nozzle in the bottom of the shoe began to close up by the metal chilling. It soon closed up entirely, and the car was then moved along until the next group of molds was in place under the nozzle, when the whole nozzle was lifted out of its place, and the steel then came with a rush for a short time. This operation was repeated until all the steel that was liquid had drained out of the furnace, but only a small proportion made ingots that could be rolled; the larger half were scrap.

The great difficulty in these pioneer days of steel making was to teach the melters to maintain the steel at the proper temperature. The margin between the proper casting temperature of the steel and the melting point of the furnace itself was very limited—much more so than to-day, as at that time no silica brick were available and we were obliged to use clay fire brick for the roof and sides of the furnace. Shortly after the heat which I have mentioned I saw an attempt made to cast a charge which had chilled in the nozzle, so that it could not be started again. By the time the shoe could be taken off the steel had chilled solid, clear back into the furnace, which was then shut down half full of steel. The next day the furnace was started up again. A quantity of pig iron was added and the steel finally all melted, but it was so slow in coming to a steel melting heat that the carbon was reduced, and several more additions of pig iron had to be made, until finally the furnace was overfilled, making it all the more difficult to get the proper temperature. It was finally tapped, but it was so cold that it chilled in the nozzle and the forehearth, so that when the latter was taken off the steel ran down over the nozzle, cars and tracks, welding the whole together, and making a mess that I was afterward told took two weeks to clear up so that the furnace could again be started.

These are only examples of the difficulties and rough experiences which were encountered in these initial trials, and it was no wonder that poor Mr. Slade was discouraged.

As is very often the case, this experiment was not very profitable to the pioneers, Cooper, Hewitt & Co. The furnace was operated at intervals for a year or two, but was finally abandoned. The manufacture was stopped, as it was not a commercial success. Those who saw these experiments were able to profit by them and avoid many of the difficulties encountered in them.

The Bay State Iron Works.

The second works to make open hearth steel in America, and the first to make a commercial success of the manufacture, were the Bay State Iron Works of South Boston, under the superintendence of Ralph Crooker. Mr. Crooker was an ironmaster of the old school, and at the time of my association with him had been connected with the management of iron works, in one capacity or another, for over 50 years.

The Bay State Iron Company had been manufacturers of iron rails for many years, but about this time the advent of steel rails had induced them to experiment in the manufacture of steel headed rails.

Their first experiment was with puddled steel, which was used in the head of the rail, in place of the hard wrought iron which had generally been used for that purpose. As this did not prove to be a success, Bessemer steel ingots were brought from Troy and rolled into bars, which were used in the pile to form the head of the rail; this also was unsuccessful. Bessemer steel as then made was found to be very irregular in quality, and sometimes impossible to weld. At this stage Mr. Crooker's attention was called to the experiments that were being made in the manufacture of open hearth steel at Trenton. He visited the works, and after watching the process for some time he became convinced that with a properly constructed furnace and the use of ferromanganese a good weldable steel could be made. He tried to make some arrangements with Messrs. Siemens' agents to supply him with plans for a furnace such as he wanted, but, failing in this, he sent for me, I having left Messrs. Siemens' employ several months before this. I soon came to terms with him, and in a few weeks we had the plans well in hand and started the construction of the proposed works.

The erection of the works was started in 1869; they were completed in a few months, and put in operation early in 1870. The plant consisted of one furnace of a capacity of 5 tons, two sections of which are shown in the first drawing on the wall. The necessary gas producers were also built, as well as a coal fired preheating furnace. Several anthracite crucible steel melting furnaces were also built for the manufacture of ferromanganese. The melting furnace was a very powerful one for its size, sharp and quick in its working. The arrangement of ports, as shown in the drawing, gave a very good mixture of gas and air, there being several small ports, side by side, with thin division walls between them. These walls were only 4½ inches thick, which necessitated very frequent repairs, as these thin division walls frequently burned through. Otherwise the furnace was all right, and many furnaces have been built since that did not work as well as this one. The bath was made much deeper than the one at Trenton in proportion to its size. The metal was cast through a forehearth in much the same manner as at Trenton, but the ingot molds were carried on a large turntable resting on conical rollers, which was turned by a steam engine through the medium of bevel gearing. This made a very good arrangement, and as it was well designed and built, it gave no trouble in operation.

The melter was a skilled heater who had been in the employ of the Bay State Company for many years. He was a man of most excellent judgment, ambitious, faithful and conscientious in his work. He had the advantage of spending a few weeks at Trenton, watching that furnace in operation, and was able to start up the Bay State furnace without much trouble, and soon became a first-class melter. The Bay State plant started off with one very great advantage over that at Trenton in that they had ferromanganese to use for the final additions in the process. As this could not be purchased at that time, we were obliged to make it in crucibles. This made it very expensive, but, as the quantity used was small, the expense did not amount to much per ton of steel. The ferromanganese was made by reducing black oxide of manganese in crucibles, with charcoal and lime, at a very high temperature. When nearly or quite melted, spiegeleisen or franklinite pig iron, containing about 10 per cent. of manganese, was added to the melted manganese in the crucible, and when the whole was thoroughly melted it was poured out into flat molds. Most of this ferromanganese contained 35 to 40 per cent. of manganese, not very rich when compared with the 80 per cent. ferro that is turned out of the blast furnaces in these days; but it answered the purpose, and by its use we were able to make steel of from 10 to 15 per cent. carbon that was perfectly malleable at all temperatures. This was a very important advance over the first experiments at Trenton. The first steel was made from a mixture of puddled bar made in their own furnaces, with some scrap steel, melted in a bath of English West Cumberland hematite pig iron. This steel was rolled into bars about 7 inches wide by 2 inches thick. This bar was used for the top of the rail pile and formed about one-fourth of its weight, the remainder of the pile being made of old iron rails. The weld was apparently as sound as if it were iron on iron. Quite a large quantity of rails were made in this manner and were put into use, but the day of weldless steel rails had come, and while the steel headed rails gave better results as to wear than those of iron, they did not begin to do as well in that respect as those of solid steel. They lacked the strength and stiffness of solid steel, and these latter qualities had as much to do with good wearing results as the mere difference of hardness of the head.

It soon became apparent to the Bay State Company that the steel headed rail was a failure, and that they

must look to some other outlet for the product of their steel plant. They were large makers of iron plates as well as rails. Their flange plates had a good reputation, but were costly to make, being puddled from charcoal pig iron. Added to this expense was the tremendous loss from blistering, the average being from 40 to 50 per cent. This meant that amount of the plate being cut up and worked over again—a very serious item of cost. These troubles, and the fact that some very good flange and fire box steel had been made in Pittsburgh in crucibles, induced them to experiment in the manufacture of soft steel plates, rolled from ingots made in the open hearth furnaces. The first were made from their own bars, puddled from charcoal iron, but this was not satisfactory, as the iron contained too much phosphorus. After quite an amount of experimenting a small quantity of steel was made from blooms made in the Lake Champlain district, direct from the ore in the old fashioned Catalan forge. The result was most satisfactory; a beautifully soft, ductile steel was produced that was perfectly malleable, hot or cold. Plates rolled from it never showed a blister and very few defects of any kind, and most satisfactory of all was the fact that it could be produced much cheaper than the best iron flange plates. A great many samples of this plate were sent around to their different customers, and the company very soon secured a large trade in boiler and fire box plates, which they were able to hold for several years. Only one furnace was ever built at the Bay State works, but this furnace was run day and night for several years in the manufacture of the highest class of ingots for boiler and fire box plates. As the price was very high this small steel furnace earned a great deal of money for the company.

Nashua Iron Company.

The next firm to build an open hearth furnace were the Nashua Iron Company, at Nashua, N. H. This was a 5-ton furnace, built under license from Messrs. Siemens. After I had finished and started the Bay State Company's plant I was employed by the Nashua Company (of which my father, S. K. Wellman, had been for many years superintendent) to build and take charge of the new steel department at the Nashua works, consisting of the open hearth furnace plant and a plate and bar mill. The building was started in 1871, and completed and put in operation the following year. There were some radical changes made in the plant from that of the Bay State Company. No preheating furnaces were used. When blooms were used they were heated in a pair of chambers on the charging side of the furnace, and were pushed off into the bath when they had reached the proper temperature. English hematite pig iron was used for the bath, to which was added charcoal blooms from the Lake Champlain district, similar to those used by the Bay State Company. These were used for the best quality of steel; a cheaper grade was made from steel and iron scrap and pig iron. Ferromanganese was melted in a regenerative crucible steel melting furnace from a mixture much the same as that used at the Bay State works. The steel was tapped from the furnace into a ladle mounted on a car running on rails, these being placed on each side of a deep casting pit, in which the ingot molds were placed. This pit ran at right angles to the furnaces, the ladle car being hauled by a chain and windlass worked by hand. This made a cheap and effective casting arrangement. For a stationary furnace it had a great advantage over the use of a shoe, similar to those used on the Bay State and Trenton furnaces, as no matter how cold the steel was it was always hot enough so that it ran clean out of the furnace. While some of it might chill in the ladle, the furnace was not interfered with at all, and we were able to get out the next heat without interference from steel being left in the furnace. Such a casting arrangement as that used at Nashua would not answer in these days of 50-ton furnaces, but it answered the purpose very well at that time. I have a vivid recollection of the first week's work after we started up the furnace at Nashua. We ran single turn, and were trying to make steel from cheap stock for some common forgings. But not an ingot in the whole week's work would forge at any temperature, and you may be sure I went home that Saturday night sick in mind and body. I do not remember the sermon on that Sunday, but before Monday morning I had found out the trouble with my steel making, and after the first heat on Monday morning, which proved to be all right in every respect, things looked brighter to me. From that time on we had no serious trouble in making any steel we wanted.

The Nashua Company were large manufacturers of forgings for railroads and marine uses, and much of the steel made by them was used to take the place of iron for this purpose. They also secured quite a large trade in boiler and fire box plates, and later on they commenced to manufacture steel for locomotive and car wheel tires. Some years later this 5-ton furnace was torn down and a furnace of 10 tons capacity was built in its place.

Singer, Nimick & Co.

About the same time that the Nashua Company were building their first furnace Singer, Nimick & Co. of Pittsburgh were building a furnace of about the same size, which was put in operation about the time of the one at Nashua. It was used for the manufacture of mild steel, principally for boiler and fire box plates, which they had previously made from crucible steel.

Otis Iron & Steel Company.

Following the starting of the open hearth furnace at Nashua and those of Singer, Nimick & Co.'s there came the new works of the Otis Iron & Steel Company of Cleveland. This was the first plant in the United States to be built for the exclusive manufacture of open hearth steel. I was engaged by the company to build and take charge of the works. A splendid location was found, almost in the heart of the city of Cleveland, near the shore of Lake Erie, with the Lake Shore & Michigan Southern Railroad on one side and the Pennsylvania Railroad on the other, giving ample railroad facilities, with competition both on incoming and outgoing freight.

Ground was broken for the erection of the works in the summer of 1873, but they were not finished until the fall of 1874. At my suggestion Alexander L. Holley was appointed consulting engineer, and he served the company for several years in that capacity.

I had seen Holley but once before he came to Cleveland on the occasion of his first visit as consulting engineer, and that was seven years before. He was then in charge of the works at Troy, and as I wanted to learn the steel business I asked him to give me a position there. He told me that he had no vacancies at that time. On his first visit to Cleveland I recalled this circumstance to him, and laughingly said, "As long as you would not give me a position, I have at last succeeded in getting you one." This was the commencement of one of the most pleasant friendships of my life, which lasted until Holley's death.

Many plans for the general arrangement of the works were worked over between us, and the one finally adopted, with some minor alterations, was one suggested by him. The steel melting plant, as originally built, consisted of two 7-ton furnaces with a regenerative preliminary furnace for preheating the blooms before adding them to the bath, and a regenerative crucible ferromanganese furnace. The most radical improvement over old practice was the raising of the charging platform about 10 feet above the general level, the material to be melted being raised by hydraulic elevators. This arrangement made the furnaces very accessible for repairs, and also gave the great advantage of our being able to have a very shallow casting pit. This plan is still followed by the latest and best works in this country.

The steel was tapped into a ladle, as at Nashua, only instead of supporting the ladle on a car it was carried on the arms of a jib crane, which was simply a swing, without any lift. This made a simple and cheap casting arrangement and one that was perfectly safe. The one crane stood on the center line between the two furnaces and the ladle swung around to the tapping spout of each. There being no lifting of the ladle when it was

filled with metal, there could be no breakdowns or upsetting. One disadvantage of not being able to lift the ladle was that we were obliged to bring the top of the molds, or groups, to very nearly the same hight. In the case of molds of different lengths this was sometimes a disadvantage, but the safety of the whole arrangement more than compensated for any disadvantage that we were put to from this cause. A swinging platform for the workmen to stand on when tapping the furnace was supported at one end on the mast of the ladle crane, and at the other on wheels that ran on the plates which covered the walls of the casting pit. The furnaces were very simple in construction and much like the one at Nashua, excepting that the heating chambers on the front of the melting furnace had been dispensed with and a preliminary furnace used, as at the Bay State Works; one furnace with doors on each side served for the two melting furnaces. The first heat of steel was made in October, 1874, from charcoal blooms from the Lake Champlain district, melted in a bath of Lake Superior charcoal pig iron. This steel was naturally of very high quality and was made into plates for fire boxes.

The starting of the works was attended with the usual mishaps, which always seem to attend the launching of new enterprises, especially in the iron business. The first thing to happen before any metal had been charged into the furnaces was a terrific gas explosion, which cracked the main gas flues, loosened up the gas and air valves, smashed manhole plates and escape valves and loosened things up generally. After our furnaces were started they were occasionally fused down by careless melters, and the steel did not always prove to be what we expected; but a careful system of inspecting prevented these mistakes getting to our customers, and after a few months of schooling of this kind things began to work smoothly and we had comparatively little trouble in making what we wanted. Of course we had to educate all of our skilled men; we had no works to go to from which to hire them, and so had no other way except to educate them. Our head melter, who originally came from New England during the construction of the works, was by trade a bricklayer, a bright and observing fellow, who was ambitious to learn the steel melting business. I sent him to Nashua and Boston some two or three months before we started up the works, to learn what he could about the operation of the furnaces. Of course, for a time he needed constant watching, but after a few months' work he became a very expert melter. Nearly all of our skilled men learned their trade after entering the employ of the Otis Company. When I severed my connection with the company, after 16 years' service, out of about 1000 employees, I was able to learn of only one skilled workman who had not learned his trade in the shops of the company.

Not only men, but all of our materials, had to be tried and proven. The question of fire brick, as well as of other refractories, was an important and troublesome one, and a great deal of experimenting had to be gone through with before the best materials could be found. In the meanwhile we were building up a good reputation for the quality of our product, which was principally plates for boilers and fire boxes. Otis steel was for many years a standard brand for the purpose in this country, and sold at the very highest price.

In 1878 two 15-ton furnaces were added to the plant. These were a great success from the very start, and were at that time regarded as of immense size. They were a radical step in advance of anything that had been built up to that time. In 1881 two more 15-ton furnaces were added, and in 1887, two more of the same size. These last two were a radical departure from anything had been built before, in that the regenerators were under the charging platform instead of under the furnace proper. The opening into the regenerators was at the end next to the furnaces, instead of at the top, which is necessarily the case where the regenerators are underneath. This opening from the regenerators was into a large slag pocket, directly under the ports. This was the case both with the gas and air regenerators. Since that time this type of melting furnace has been very largely used in this country, all of the late furnaces at the Homestead Steel Works, Duquesne Steel Works and the Sharon Steel Works being of almost exactly this type. The Otis Works were at one time the largest open hearth plant in this country.

As I have said, the principal raw material used at the start for making the high quality of soft steel which was turned out at the Otis Works was charcoal blooms from the Lake Champlain district. These were used in largely increasing quantities from year to year, until the consumption reached as high as 12,000 to 15,000 tons per year, at an average cost of $45 to $60 per ton. This seems like an enormous price to pay for raw material. It was; but as the finished plates were sold at from $135 to $160 per ton, a fairly good margin was left for profit.

Later on a larger amount of puddled blooms were made from Bessemer pig iron in mechanical puddlers. Washed metal made in revolving Pernot furnaces by the Krupp-Bell process was also used.

Introduction of Basic Steel.

The first basic steel produced in this country was made at the Otis Works in 1886. During a visit to Europe in 1885 I saw the process at work, and was much impressed with its possibilities. I immediately arranged to have a small cargo of Styrian magnesite sent over, and as soon as we could spare a furnace to make the experiment we put in a lining of calcined magnesite on top of the silica bottom, which had been melted down as low as possible. This magnesite was not fused in, as is the practice in these days, but after being mixed with tar was rammed in place while the furnace was cold. This was the practice in Europe at that time, and we simply followed out what we had seen on that side of the water. As soon as the bottom was made, we started up the furnace, which was operated experimentally for some four months, making a good quality of basic steel. All of it went to our regular customers in our regular work, without any fault being found. It was kept as a great secret, and no one outside of the company's works knew what we were doing. During all of this time we were extremely busy. The basic process was much slower in operation than the acid, and this made the output of the furnace so small that I was at last forced to yield to the pressure brought by the selling department for more steel, and changed the furnace back to the acid process. Some months later the basic process was started at the Pennsylvania Company's works at Harrisburg and the Carnegie Works at Homestead. To-day at least three-fourths of all the open hearth steel made in America is manufactured by the basic process, and this proportion is bound to increase. It is my opinion that there is no question about the fact that the very best qualities of all grades of open hearth steel can be made cheaper and better by the basic process than in any other way. The basic process of steel making is so simple, both in theory and practice, that it seems strange that it was not thought out and put in practice before it was. The same principles are involved, and the same reactions go on in the puddling process which has been in use for generations. The only difference is that the temperatures are lower in the puddling furnace than in the open hearth; as a consequence the lining in the latter must be the more refractory.

Twenty-five years ago it was considered an axiom that phosphorus could not be removed from iron at a high temperature, but the invention of Snelus and Thomas demonstrated that it could be done. To-day thousands of tons of steel are being made by the basic open hearth process from iron containing more than 0.5 per cent. phosphorus, that is better in every respect than was the steel of which I have been telling you, made from costly charcoal blooms containing only 0.02 to 0.03 of 1 per cent. of that element.

Large Furnaces.

Very soon after the Otis Steel Works were started, open hearth furnaces began to be erected all over the country. They were built by the Pennsylvania Steel Works, at Steelton, Pa.; Cleveland Rolling Mill, at Newburg, near Cleveland; the Shoenberger Works, at Pitts-

burgh, and many others, among all of which the Carnegie Works, at Homestead, was the most important. This is to-day the largest open hearth plant in the world, consisting of 48 furnaces, of a capacity of from 40 to 50 tons each, having a total capacity of at least 1,300,000 tons per annum. The size of furnaces has increased from the little 5-ton furnace at Trenton and Boston up to those having a capacity of 50-tons, which is the average size now being built. Furnaces of this size nominally, at Ensley, Ala., have made heats yielding 74 gross tons of ingots.

Furnaces of 100 tons capacity are being built, and designs have lately been made for a furnace which will probably be built of 200 tons capacity. These large furnaces, however, are not properly melting furnaces, as the bulk of all the iron is charged into them in a liquid state, direct from the blast furnace. They might more properly be called "converting furnaces."

The output of open heart steel has grown from 893 tons in 1869, to 3,402,552 tons in 1900, against 6,684.770 tons made by the Bessemer process in 1900. But few new Bessemer converters have been built in this country for several years, and it is not likely that many more will be built. The production of basic open hearth steel in this country will soon exceed the Bessemer in tonnage. Holley used to say, "The open hearth process will some day go to the funeral of the Bessemer." It will be many years before that will come to pass, but the day is not far distant when the great bulk of all the steel in this country at least, will be made on the open hearth of the Siemens regenerative furnace by the basic process.

The address was illustrated by drawings showing the progress in the size of the furnaces, increasing from a 5-ton furnace at the Bay State Works, up to the 50-ton furnace at the Homestead Steel Works, and the 200-ton furnace which it is proposed to build.

Changes in the Mexican Customs Tariff.

DURANGO, MEXICO, November 23, 1901.—Changes of an important character have been made in the "General Maritime and Frontier Customs Ordinances" hitherto applying to importations of foreign goods into Mexico. The decree was recently published in the *Diario Oficial*, the Government organ, at the capital, bearing the name of the Secretary of the Treasury, Señor Limantour. The introductory clause reads:

The President of the republic has been pleased to address to me the following decree: "By virtue of the powers granted to the executive under article 2 of the revenue law, passed on May 22 last, I have seen fit to decree as follows:"

Then follow the amendments embodied in 11 articles. The various items scheduled in this supplementary bill cover articles of many classes of crude materials and manufactured goods, and seem to be taken from every section of the general customs law.

The following abstract has been made of the decree so far as it affects iron and steel and their products, and also articles in allied industries likely to be within the range of the activities in which the readers of *The Iron Age* are interested:

Metals.

Section 291. Tin in bars or in bulk, gross kilo.....$0.12
294. Lead in bars or pigs, gross kilo..... .03
297. Leaden goods not otherwise specified, legal kilo..... .08
300. Lead in sheets, or piping and glaziers' lead, gross kilo. .05
305. Bar steel, round, square, flat, half round, octagonal or hexagonal, gross kilo (Note 100)..... .05
306. Steel in cylindrical, octagonal, hexagonal bars or T-shaped, for use in mines (Note 100), gross kilo.... .01
313. Plows and their loose and repair pieces (Note 106), gross kilo..... .01
321. Axles and axle boxes of iron or steel, for vehicles (Note 106), gross kilo..... .10
321A. Ferromanganese containing 25 per cent. or more of manganese (Note 316), gross kilo..... .05
329. Steel springs for vehicles, gross kilo..... .10
331. Posts, cross arms and spikes, or iron or steel for electric overhead wires..... Free.
332. Rails, fish plates and spikes, points, ties and frogs of iron or steel, for railroads..... Free.
336. Manufactured goods of tin, tinned or nickel plated iron, either wholly or in part, not otherwise specified and whatever be their weight, legal kilo..... .20
336A. Iron or steel ware, enameled either wholly or in part, that is not otherwise specified and of whatever weight, legal kilo..... .25
336B. Iron or steel goods, not otherwise specified, legal kilo. .15
340. Nails, screws, bolts, nuts and rivets, of iron or steel, as well as iron or steel braces for structures (Note 111), legal kilo..... .10
341. Tanks, cisterns, receptacles or vats of iron or steel, with more than 2500 liters capacity, gross kilo..... .01
342. Iron or steel wire cloth of all kinds, gross kilo..... .10
787. Suction and force hand pumps, with their spare or repair pieces (Note 272), gross kilo..... .01

Miscellaneous Articles and Products.

Section 128. Flax, hemp, ramie and other vegetable fibers, not otherwise specified, rough or hecked, gross kilo..$0.02
182A. Cottonseed oil, refined, in vessels of wood, drums or cans (Note 306), gross kilo..... .09
182B. Cottonseed oil, crude, in tank car or ship (Note 307), net kilo..... .05
182C. Cottonseed oil, crude, in wooden vessels, drums or tanks (Note 307), per 100 kilos, gross..... 4.50
183. Coco oil, and raw or boiled linseed oil, in tank, car or ship, net kilo..... .10
183A. Coco oil, and raw or boiled linseed oil, in wooden vessels, drums or cans, gross kilo..... .09
188. Vegetable tar (Note 67), gross kilo..... .06
218. Tanks or receptables of wood with a capacity of over 2500 liters, gross kilo..... .01
218A. Tanks or receptacles of wood, not otherwise specified, and all wooden barrels not specified, gross kilo..... .05
260. Platinum crucibles..... Free.
364. Emery, in powder or grains (Note 118), gross kilo.. .01
374. Black plumbago (Note 122), gross kilo..... .05
415. Tiles, ridge boards and ventilators of clay for roofs, and drain pipes of clay (Note 141), per 1000..... 2.50
417. Insulators of glass, china or porcelain, for electric wires..... Free.
670. White and colored varnish (Note 201), legal kilo..... .20
679. Paints in powder or crystals (Note 121), gross kilo.. .07
679A. Prepared paint (Note 201), gross kilo..... .12
683. Chloride and hypochloride of lime, soda or potash (Note 205), gross kilo..... .01
788. Incandescent light bulbs (Note 273), gross kilo..... .15
796A. Arc light lamps (Note 317)..... Free.
817. Barrows with one or more wheels (Note 284), gross kilo..... .01
818. Railroad cars and coaches of all kinds, with repair pieces of iron or steel (Note 318)..... Free.
835. Front wheel gears for coaches, stages, omnibuses or buggies, rough or finished, gross kilo..... .60
842. Walking sticks with firearm, air gun or sword attachment, not having handle or trimmings of gold, silver or platinum, legal kilo..... 2.00
854. Lubricating oils (Note 288), gross kilo..... .05

The various explanatory notes quoted in the foregoing sections of the decree cover much space, hence only those referring specifically to the iron and steel items are reproduced; for the rest the reader is referred to the copy of the amendments on file in the office of *The Iron Age*.

Note 100. Mining bars are those which consist of round, octagonal or hexagonal steel bars with a head and point formed at each end. If said bars are imported of a larger size than common, to be afterward cut to the necessary lengths and the points to be hammered to the required form, they will nevertheless be included in section 306.

The above bars must have a minimum diameter of 19 mm. and a maximum of 32 mm., measuring them, when they have a prismatic section, across the opposite faces and not the ridges.

The mining bars which do not have the above diameter will be included in section 305.

Section 306 also refers to steel bars with a T-shape that are employed in mining work, and which are imported in different lengths, to be afterward cut to those required by the mechanical drills for which they are intended.

Note 111. This section includes the iron or steel spikes of all shapes, as well as the screws, bolts, rivets and other fittings of iron or steel, and the nuts with or without thread of the same metal. The iron or steel spikes with two points that are called cramps and the grooved plate for frames are included in this section. (See note 102.)

This does not cover the special spikes for holding rails and the bolts that accompanying fish plates, all of which are included in section 332 under the head of railroad material.

Section 340 also covers the iron or steel braces for structures, including the nuts, washers or stretchers of such braces. The iron or steel plates used at the ends of these braces in masonry buildings will be covered by said section 340 when imported together with the corresponding braces.

Note 315. The loose parts of the plows covered by this section are those pieces belonging to the plows which cannot be employed for any other purpose, and therefore those that could have another application, even though it may be true that they are intended for the plows, will pay duty according to their material and class.

Note 316. This section refers to ferromanganese in pigs that contain 25 per cent. or more of manganese.

The alloy of iron and manganese which is called ferromanganese is intended to improve the condition of steel. This alloy is very hard, and therefore cannot easily be filed. In order to ascertain whether the proportion of manganese is over or under 25 per cent., it is only necessary to bring a steel magnet near it; if there is any attraction the proportion of manganese is less than 25 per cent., and in the contrary case it is greater, as when the percentage of manganese exceeds that figure the iron loses its power of attracting a steel magnet. The iron which contains less than 25 per cent. of manganese, and which is known in the trade under the name of spiegeleisen, will be included in section 322.

Note 318. The repair pieces for railroad cars which are included in this section are those finished pieces of iron or steel which form part of the same and cannot be used otherwise; such as wheels, draw heads, shafts, springs, &c. For this reason those pieces that could be otherwise utilized, even though it may be proved that they are imported for use on railroad cars, will pay duty according to their material and class.

Articles 7, 8 and 9 of the amendments deal with modifications of the vocabulary of the present text of the tariff.

The decree became effective upon the first day of the present month. J. J. D.

OBITUARY

CLEMENT STUDEBAKER.

Clement Studebaker, president of the Studebaker Bros. Mfg. Company, died at South Bend, Ind., on November 27. He was born on March 12, 1831, in Adams County, Pa., about 7 miles from the scene of the battle of Gettysburg, and was one of a family of ten children, five of whom were boys. His father, of German parentage, was born in this country and was a wagon maker. In 1818 he made the first Studebaker wagon, of the same pattern that developed under his sons a great industry. When Clement was four years of age the family moved to Ashland County, Ohio. Financial reverses had overtaken them, and the new home was a crossroads smithy, where horseshoeing was the mainstay and occasional wagon making a great event. In the winter Clement attended school until he was 14 years old. Then he engaged to work on a farm at $2 a month, but not liking this he apprenticed himself to his father to learn wagon making. At the age of 20 he determined to go West, and went as far as South Bend, Ind., where for a time he taught school, studying in the evening, that he might teach in the daytime. He considered this experience as the most valuable of his life. After giving up teaching he engaged with his elder brother, Henry, also a wagon maker by trade, in their original business. They opened a shop in South Bend in 1852 under the firm name of H. & C. Studebaker, with a combined capital of $68, and lived to see this humble establishment develop into the greatest wagon factory in the world. In 1858 J. M. Studebaker bought out his brother Henry, who retired to a farm. In 1864 Peter E. Studebaker was admitted to partnership, and soon after the remaining brother, J. F. Studebaker, acquired an interest. The business was incorporated in 1868 and Clement Studebaker was made president. He took a deep interest in philanthropic movements and public affairs, and was United States Commissioner for Indiana to the Paris Exposition, member of the Pan-American Congress and president of the Chautauqua Assembly of New York. He was a prominent member of the Methodist Episcopal Church. Since the foundation of the Carriage Builders' National Association he had been a leading member, having been at one time its president. He was also a member of the Board of Trustees of Depauw University at Greencastle, Ind. A widow and three children survive him. The children are George M. Studebaker, secretary of the Studebaker Bros. Mfg. Company; Clement Studebaker, Jr., cashier, and Mrs. Charles Arthur Carlisle, whose husband is purchasing agent.

SIMON A. FRASER.

Simon A. Fraser, a director and the general works manager of the Nova Scotia Steel & Coal Company, Limited, died November 22 at his home, New Glasgow, N. S. Mr. Fraser was born in New Glasgow in 1857 and in 1881 became associated with his brother, Graham Fraser, in the establishment of the Nova Scotia Steel Company. He was an engineer of much more than average ability and contributed very considerably to the improvement in steel making appliances, one of the more important of these being the Fraser-Talbot mechanical gas producer, the really improved essential feature of which, as now used, was worked out entirely by him. The combination of mechanical skill and executive ability possessed by Mr. Fraser was such that as the operations of the company extended repeated calls were made upon his energy in connection with the installation of the plants at New Glasgow, Ferrona and Sydney Mines, as well as the ore transportation and loading plants at the company's Wabana iron mine, Newfoundland. He was closely identified with the public life of his native town, where his absolute integrity and sterling character were recognized.

JOHN BEST.

John Best, a pioneer boiler and engine manufacturer and one of the leading citizens of Lancaster, Pa., died from heart disease on November 25 at his home in that city, in the eightieth year of his age. He was born at Soudersburg, Lancaster County, Pa., of Scotch-Irish parentage, and early in life became an apprentice to the blacksmiths' trade. In 1843 he obtained employment at a shipbuilding establishment in Wilmington, Del., where he learned the trade of boiler making and became a first-class mechanic. Returning to Lancaster in the early 50's, he began the manufacture of boilers, and subsequently of engines, with which industry he was actively connected for nearly half a century, building up a very large business which extended all over the world. Mr. Best was a public spirited citizen and greatly aided in the industrial growth and prosperity of Lancaster. He was actively interested in a number of local industries, including Best's Boiler & Engine Works, the Lancaster Bolt Company, the Lancaster Radiator & Tube Company, Lancaster Chemical Works, &c. In 1890 he purchased the plant of the Lancaster Radiator Company and added it to his works. He was highly regarded by his business associates and held the esteem of his fellow citizens to a remarkable degree. Mr. Best was twice married and leaves a widow and 11 children.

NOTES.

PETER CAMPBELL, founder of the foundry firm of Peter Campbell & Co. of Hoboken, N. J., died on November 25, in Jersey City, N. J., aged 72 years.

ARTHUR W. SOPER, president of the Pintsch Compressing Company and the Safety Car Heating & Lighting Company, a director of the Standard Coupler Company and prominent in a number of other industrial and commercial organizations, died on December 1 at his home in New York City, at the age of 63 years.

Ground has been broken at Donora, near Pittsburgh, for the new plant of the Matthews Woven Wire Fence Company, which is being removed from Jacksonville, Ill., to Donora. Three steel and brick buildings will be erected and the works will get their wire from the Union Steel Company, near whose plant their property is to be located.

The Iron Age

New York, Thursday, December 5, 1901.

DAVID WILLIAMS COMPANY, - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - BUSINESS MANAGER.

The Copper Situation.

The copper situation has been sadly unsettled during the past ten days. Those who have been credulous enough to repose confidence in the apparent controlling interest of the market have been shocked by the developments, and those who have never ceased to pour forth execrations upon the methods which have made copper almost a byword even in the realm of speculation have been furnished with ample ammunition to continue the assault upon both the metal and the securities issued by the copper companies.

In London the conditions have been little short of demoralization, the incidents of the closing days of the month of November having a parallel only in the events which attended the dropping of the curtain upon the notorious French syndicate about 15 years ago. The decline suffered in the price of copper ingots in three days last week at London was £7 10s., the depreciation being accompanied by unprecedentedly heavy selling. A further drop came on Saturday last, carrying prices down to £57 10s. for spot and £56 for futures, a decline of £8 17s. 6d., and £8 7s. 6d. respectively, the lowest prices touched since the fall of 1898. At the close the market was at sea.

In New York Dame Rumor, with her thousand tongues, has been busy stirring mischief. But so plausible have been the stories afloat that the public—groping in the dark—has been inclined to receive them, if not as truth, at least as her accredited representative wearing the garb of fact. The parade of statements has been highly dramatic, and some of them have had a tragic reception.

But with all the depressing elements the New York market for the metal has been sustained by the powerful financial interest which still exhibits the ability to artificially maintain the price of both lake and electrolytic copper within a fraction of the prices prevailing when active consumption made a high level of value legitimate.

The large producing companies are charged with clandestinely relieving the market pressure by disposing of some 60,000,000 pounds at a reduction of 2 to 3 cents per pound in the market price of the spot metal, insuring the contracting parties against any decline in the market price. The heavy depreciation of copper at London, following the rout of speculators, was attributed to the cabling of these rumors from New York to London.

But while the New York market for the metal, as far as the public is concerned at least, has remained pegged, the market for the stock of the Amalgamated Company has been literally jumped on at the Stock Exchange, falling to the lowest record price since the security was placed upon the market, 72½, a decline of nearly 60 points from the highest point, and although there was a moderate rally from the lowest point touched, it reflected only the covering of short interests.

Crimination and recrimination, endless litigation and rumor, have succeeded in discrediting the stock and given rise to serious charges of blind pooling and manipulation. If these various stories lack truth the directors owe it to themselves, to the stockholders and to the public to make a clear and satisfactory statement of the situation as it really is, backing the assertions by accredited facts and statistics of an unimpeachable character. The absence of such a statement and such data is taken by the public as evidence of the truth of all the depressing reports. Those in a position to know seem to content themselves with a mere denial of the reports that prices have been reduced.

With reduced consumption of copper in England, France and Germany; with decreased exports from the United States and with other countries—Chile, Peru, Mexico and Japan—supplying a large proportion of the smaller European wants; with further accumulation of stocks in the United States reported, notwithstanding the curtailed production; with independent copper companies refusing to reduce output and able to sell at much lower prices than the ostensible market; with prices at London equivalent to 12½ to 13 cents here, inviting imports by local consumers and purchases already made, it would seem a suicidal policy to continue to hold copper at prices which only confirm consumers in the course of buying just as little as possible, except for foreign sources.

It is possible, of course, that a manipulation of the stock market may offer greater inducements, and profits accruing may more than offset the loss sustained on the metal. But, of course, the interests involved would wish to be absolved from any such action or intention.

It is announced that the statistical position of copper is much stronger than the public is aware. If this is so the taking of the public into confidence by exhibiting the figures upon which the statement is based would clear the atmosphere and produce a sound market. But, judging from known facts, throwing mysteries out of consideration, the copper market will continue unsettled and even demoralized until natural laws are allowed to more nearly shape the course of prices without interference from extraneous factors.

The present situation is an exhibition of how far or how long an enormous money power can subordinate and subvert economic principles. But there can be but one outcome; law is eternal and patience will witness the end.

The Puzzling Course of Trade.

The manufacturers and merchants who have been too closely governed by their ideas of prudence during the past six months have found their judgment at fault. The course of trade during this entire year has borne a close analogy to the course of the stock market the previous year. All who took a hopeful view of the situation and manifested their confidence by freely covering their requirments have been on the winning side. Those who thought it well to be prudent and that a change was probably due in the direction of lower prices and a reduced volume of business find that they have been mistaken. The year has been a remarkable one in this respect. Many of the most experienced members of the iron and steel trade who have been governed largely in their operations by recollections of what occurred after former periods of extreme activity have endeavored to apply their experience to the conditions confronting them this year, and have been surprised to find themselves out of step, so to speak. The active conditions prevailing this autumn were foreseen by comparatively few. It was expected as a matter of course that the lines immediately affected by the strike during the sum-

mer months would have a season of very great activity because of the heavy accumulation of business. It had not been supposed, however, that the effect of the activity in these lines would by any means be communicated to other branches of trade. In this respect the most astute observers of the signs of the times have been deceived. It will be recalled that during the early summer months those who are in the habit of placing season contracts for large quantities of iron and steel were quite conservative in their purchases, being of the opinion that before many days a period of comparative quiet would rule, and that prices would then probably be lower. They found, however, much to their surprise, that by the time they expected prices to collapse a great change had occurred in the temper of the trade, and that values were on the up-turn, and they were compelled to make additional purchases at considerably enhanced prices.

It is noteworthy in this connection that the machinery trade keeps up its remarkable activity. This branch of business, it was thought, would be sharply affected by the great falling off in the foreign demand for American tools and miscellaneous machinery. Individual establishments are feeling this diminished demand to some extent, it is true, but taking the great mass of machinery establishments, they are reported to be not only actively employed, but are in possession of orders which insure several months of activity, even though new business should materially decline. This condition of the machinery trade shows more emphatically than almost any other line how general a condition of prosperity prevails throughout the country. Naturally a great deal of the demand for machinery comes from manufacturing establishments impelled to make improvements by the heavy demand for their products. It always happens that when such a condition prevails the machinery trade feels a double impetus. It is stimulated not only by the demand from manufacturing establishments, but also by the necessity for increasing the equipment of the machinery manufacturers themselves. Seldom has greater activity been shown in the enlargement of machinery establishments than during the current year. This enlargement still continues, and projects are steadily going forward involving new investments in this line and promising continued activity.

The only danger existing in the situation as presented is that inasmuch as prudence and conservatism have latterly been somewhat costly virtues, therefore a disposition may develop to depart from these principles. Within the past two weeks such indications have appeared in some quarters. Those who feel disposed to make rather reckless purchases are actuated by the belief that prices are likely to be higher, and expect to reap substantial benefit by making contracts at such prices as are now prevailing. In view of the apparent policy of the leading manufacturers of iron and steel, higher prices are not now regarded as probable. It is believed that it is the intention of the leaders in the trade to keep prices at about the present level and not permit them to seriously advance. Under such conditions the covering of requirements for a reasonable period would seem to be all that is necessary. Business conditions abroad are by no means reassuring, and it is not unlikely that at an earlier day than many expect we will feel the effects of the trade depression existing in other countries. If this occurs those who are not burdened with obligations to receive material will find themselves in better shape to endure the changed conditions than if they must provide for deliveries of material contracted for at higher than the then ruling rates. The old fashioned doctrine of prudence in business may occasionally prove to be unprofitable, but in the long run it cannot be anything else than satisfactory, and this is not the time to depart from it.

"Ca' Canny" in British Industries.

The London *Times* has made a discovery. This consists in a new principle which has been introduced into the operations of the trade unions—which, by the way, is not new and is exactly the reverse of a principle. It is known as "Ca' canny," a term which seems to have been adapted from the Scotch dialect. It is said that when two Scotchmen are walking together and one walks faster than the other finds agreeable, the less enterprising pedestrian says to the one disposed to outwalk him, "Ca' canny, mon, ca' canny." Just what this means no one but the Scotchman knows, and he cannot tell in intelligible language, but it signifies an injunction to the fast walker not to exert himself unduly, since by so doing he accomplishes nothing for himself and inconveniences those who may wish to keep up with him without the undue waste of tissue. Somehow the phrase has caught the ear of the British workman, as "lehm op" caught the ear of the German Uhlans, and has been incorporated into trade union nomenclature to mean the code of unwritten rules by which the limit of a day's work is fixed at a result which one who does not care to exert himself finds convenient.

"Ca' canny" is resorted to under normal conditions for reasons identical, no doubt, with those which prompted the Amalgamated Association of Iron, Steel and Tin Plate Workers to fix a limit of daily output per man and per machine, and to penalize by fines the misdirected zeal which induced an industrious man to exceed these limits. As they were from 25 to 33 1-3 per cent. below what a man could easily do under average conditions of a good plant with good management, the allurements of the piece rate induced wholesale violations of the Amalgamated's rules, and finally led to its dissolution by driving from its membership a majority of those who were not incorrigibly altruistic and bent upon self sacrifice for the benefit of the lazy or incompetent. "Ca' canny" is not, therefore, new; but from the data gathered by the London *Times* it seems to have been refined and given a new application by the trade unions of Great Britain. For example, a dispute arises over some question of trade usage or wages and is referred to a committee for settlement. No strike is proposed or contemplated, as in the event of such an issue being taken public opinion would probably sustain the employers and place serious obstacles in the way of securing the advantage for labor which results from sympathy. If, however, the employers do not meet the committee of the union, or do not make the concessions expected and desired, the word is passed around to "Ca' canny," and this means that every man who gets the "tip" is expected to gradually slacken his pace so that production per unit of labor cost shall be cut down to a ruinous minimum, but so gradually and generally that no one can be singled out as lagging behind his fellows and selected for disciplinary dismissal. This can usually be done in such a way that "the office" does not find it out until it has been for some time in progress. As the rule, foremen and superintendents are afraid to say anything about it. They recognize that they are helpless against a concerted movement of this kind and are afraid of receiving instructions to jack the men

up to greater industry, with which it would be impossible to comply. Not much shop experience is needed to devise ways of wasting time, and where all in the shop are working together to that end it is easy to reduce output a quarter or a third without the cause being apparent.

But the habit of laziness at some one else's expense is very easily acquired, and from being a means to an end "Ca' canny" seems to have gradually been erected into a system, and its English equivalent "Go easy," is becoming the settled policy of the British workman. The socialistic leaders of the labor movement are openly preaching that men should not put forth their best efforts in work done for hire. It is their duty to work in such a way that others must be called in to help them, thus giving employment to a greater number of hands than would be needed if every man fortunate enough to secure employment did the best that is in him. Its original purpose was probably to gradually absorb all the non-employed, and set the pace at a gait which the least capable would have no difficulty in conforming to. But philanthropy of that kind quickly degenerates into narrow and shortsighted selfishness, as it appears to have done in this instance. It suits the unambitious wage earner for reasons of his own, and he is not in the least deterred from following it for the reason that the result is to handicap the productive industries, drive trade away from British workshops and gradually narrow the field of employment for skilled and unskilled alike. That it is doing so warrants the London *Times* in recognizing the present tendency of organized labor as involving a "crisis in British industry." It says:

> There is only too much reason to fear that, without seeing the full significance of the movement, the workingmen of this country are adopting the "Ca' canny," or "Go easy," principle so generally that this mischief, aided by the more aggressive forms of trade unionism, is eating the very heart out of British industry. It is not a question whether or not a man is working full time—whatever the precise limit of that time may be—but, "Is he working with his full energy?" and the answer is that, though there is a universal desire for a fair day's pay (and more, if it can be got), there is an almost universal unwillingness among those who are subject to trade union influence to do a fair day's work. A man may be employed and paid for ten hours, but there is a steadily growing disposition to put into those ten hours only eight hours' real effort, while those engaged for eight hours will give only six hours of their energy, and so on. From trades of the most varied descriptions the same story comes. Not that all who adopt the principle do so willingly. There are innumerable instances of men anxious to do their best who are compelled by their fellows to do as little as they, being so treated that they are forced to abandon any idea of doing their duty to their employer and of obeying the dictates of their own conscience. Neither is it of much use to search among union rules for evidence in black and white of the formal adoption and enforcement of a principle which has thus become the bane of our industrial system. The average trade unionist is much too 'cute a person to offer evidence against himself in this way. The more prominent leaders would, of course, disavow the principle; but though they may not encourage it openly they do so tacitly, and their subordinates, "shop delegates" and others, do so directly. The whole system, as now being worked, is, in fact, the direct outcome of trade unionism coupled with advanced socialism. In its mildest phase it takes the form of keeping the strong, efficient and willing worker down to the productive level of the weakest and most inefficient.

If the facts are as that journal states, no other explanation is needed for the existence of the industrial conditions in Great Britain which are reflected by current statistics. It is often difficult to understand the reasons for conditions existing on the other side of the Atlantic, especially when studied in the light of American experience. No doubt we have like conditions here to some extent, especially in such diffused industries as those comprised in the building trades; but they do not seem to have constituted a menace to our industrial system. The representative American workman probably has too much self respect to indulge generally in a practice so dishonest as that of "Ca' canny;" perhaps he knows too much not to see that whatever diminishes the productiveness of labor reacts to his disadvantage. It may also be that American employers are better fighters than English employers, and have thus far managed to hold such a tendency in judicious restraint. This is to be hoped, at least. The most significant fact in connection with the discussion of "Ca' canny" in the British journals is that no remedy for it has even been suggested. Appeals to the trade union membership are useless. The partisans of this vicious system do not read the great journals of opinion, like the London *Times*, and would not be influenced by them if they did. The problem of trade union domination seems to be working out its own solution by the slow and painful process of incremental industrial paralysis—which is something all right minded people have great reason to regret.

CORRESPONDENCE.

The Machine Tool Trade and Reciprocity.

To the Editor: During the past two or three years American factories have been very busy with both domestic and foreign orders. Many manufacturers, finding themselves unable to supply the increased domestic and at the same time large foreign demand, have gradually added to their equipment until to-day the productive capacity of their works is much larger than a few years ago.

Now a great trade depression has spread almost over the entire Continent of Europe. As if this were not enough, the United States Treasury Department has entered upon a destructive tariff war with Russia, the largest and most promising foreign field for the sale of American manufactures.

Large quantities of machine tools, wood working machinery and other manufactures were formerly exported to that country, but since the new Russian retaliatory duty of $4.77 per 100 pounds has gone into effect this trade has practically ceased. The American must now pay over 57 per cent. higher rate of duty, besides shipping his goods from 5000 to 6000 miles further than the Germans, who copy and imitate all things American.

In shipping to France America pays the maximum duty on all manufactures. On machine tools this is from 33 1-3 to 50 per cent. higher than that charged Europeans.

Germany is now preparing to check American imports into that country, because America seeks to sell her products in German markets while closing her own doors to imports by a prohibitive tariff.

The exceedingly hard times from which Europe is now suffering, together with the stopping of shipments to Russia, has greatly diminished the export of American machinery. Should there be any decrease in the domestic demand our manufacturers will find it exceedingly difficult to keep their enlarged works employed.

While times are still prosperous America should turn her attention to a rearrangement of her tariff, and enter on broad and liberal lines into reciprocal trade relations with her foreign customers.

There is scarcely an article which cannot to-day be produced better and cheaper in this country than abroad.

As Americans go to foreign countries and sell their products in the face of home manufacturers there, paying the long freight and duty, why should they be afraid to let those manufacturers come here and try to get an order once in a while? Foreigners will not permit Americans to longer usurp their markets without receiving some privileges in return.

Why, for instance, should England admit American wood and metal working machinery free of duty when we charge 45 per cent. duty on anything in those lines that she chances to offer us? If she can produce it better or cheaper than we can her example, as exemplified by the imports, will sooner or later stimulate some of our restless, enterprising spirits to devise a way or

means of manufacturing it even better and cheaper—not cheaper because of any less expense for labor, but by devising better methods or better machines to do the work. G. P. ALTENBERG.

CINCINNATI, OHIO, November 22, 1901.

To the Editor: We notice that in your report of Mr. Emmons' remarks at the National Founders' Association meeting held recently in New York you state that Mr. Emmons said his company (the General Electric Company) could not get best results from molding machines until they employed skilled molders on them.

Mr. Emmons' remarks to this effect applied to only about six machines of 67 in use, two of these six being large hand ramming machines.

As 65 of the 67 machines at Schenectady are of our manufacture, we deem it only fair to ourselves, as also to Mr. Emmons' exceptionally intelligent management, to ask you to publish the fact that molders are employed on some very large power ramming machines and the hand ramming machines above mentioned only.

THE TABOR MFG. COMPANY.

PHILADELPHIA, PA., December 2, 1901.

[Our correspondents are slightly in error in their opening sentence. The statement quoted in our report as coming from Mr. Emmons was that he had not met "with success until he obtained a trained operator of the machines to supervise their operation. Since then their adoption has been most successful. Intricate and comparatively large castings are being turned out on the machines now" and "the number is constantly being increased," but "his experience showed that the molders on certain difficult work were obtaining better results than did the laborers first employed." The additional information given by the Tabor Mfg. Company is nevertheless quite interesting.—THE EDITOR.]

The Mining Engineers in Mexico.

Aguas Calientes.

Early on Thursday morning, November 21, the train arrived at Aguas Calientes, or Hot Springs, two baths being in the immediate vicinity of the station. The city itself is rather small, with few imposing buildings outside of its plaza. The industries of the place, which is on the border of the more fertile district, center in the smelter of the Gran Fundicion Central Mexicana and in the railroad shops being completed by the Mexican Central Railroad. The smelting works were the principal attraction. The plant is located at some distance from the town proper, and is peculiar in that it contains both lead and copper furnaces. It draws, as a custom works, from a wide territory, a considerable share of the copper coming from the mines of the Guggenheims of New York at Cobre and of other outside properties. The copper ores of the district in question being accessible by railroad are available down to 3½ to 5 per cent. The Aguas Calientes plant consists of five copper stacks, two of them being unusually large. The matte is converted in a plant of three converters of 8 tons capacity each of the Aiken type, first introduced at the Boston & Montana works at Great Falls, Mont. There is also a plant of four Fortschaufelung roasting furnaces, served by four Taylor gas producers built by R. D. Wood & Co. of Philadelphia. The lead plant consists of three stacks, 40 x 150 inch tuyere area. There are also two briquette machines for handling flue dust and fine ores. There is in course of construction a very elaborate condensation plant, which will be equipped with a 250-foot stack. The capacity of the works is about 1000 tons of ores per day.

There seems to be a good deal of trouble in holding the native labor. It is reported that 50 per cent. of the wages must be paid every day in cash. In spite of the fact that the company pay a very liberal premium to all who have worked 30 consecutive days, only 40 per cent. of the men earn the premium.

During the afternoon a band played in the Jardin San Marcos and in the evening in the Plaza de la Constitucion.

A short run during the night brought the trains to the city of

San Luis Potosi,

which owes its importance to the discovery in 1575 of the mining district of San Pedro, located about 13 miles west on the western slope of the great central plateau. Other tributary districts are El Populo, La Raposa and La Bufa. The ores carry gold and silver, while lead predominates among the base metals.

The party were conducted to the Government Palace, where the engineers were introduced to the Governor, Don Blas Escontria. A special train was then taken to the smelting works of the Compania Metalurgica Mexicana, the general manager of this American company being A. S. Dwight. These well equipped works contain 12 large lead smelting stacks in a row, three of them being in blast at the time of the visit of the engineers. The ores and cupriferous mattes are roasted in a number of long roasting furnaces, and there has just been completed a small reverberatory furnace for converting into blister the copper matte, which is now shipped to the United States. One briquette machine is in use for handling flue dust; a second was recently destroyed by fire. One of the interesting features of the plant is the method of handling the slag from the furnaces. The slag ladle car is conveyed to the dump, where the mass of liquid slag is tapped, the skull remaining being dumped upon a platform under which there is a train of cars. This ladle skull is charged back into the furnaces.

A rather unusual accessory of the works is a tannin extracting plant. The company own a good deal of timber land, selling to the railroads and other consumers, besides providing for their own requirements. The bark stripped from some kinds of this timber goes to the works at Potosi. It is shredded and then charged into large vats. A weak solution of tannin, obtained in exhausting other charges, is sprinkled over it, and after being allowed to remain in it for a time is drawn off. Subsequently the bark is further leached. The solution is boiled down with exhaust steam and the concentrated liquor is shipped to tanners throughout the country, the product being about 35 to 40 barrels per day, weighing about 200 pounds each.

After partaking of a bountiful luncheon in the pretty garden of the residence of the general manager a small number of the visitors were driven in coaches to the magnificent dam, the Presa de San José, which is to be used for storing water. The rest of the party returned to the town to visit the Scientific Institute, with its collection of ores illustrating the mineral occurrences in the leading mining districts of the State of San Luis Potosi, including Catorce Matehuala and San Pedro. Others visited the cathedral, the Church of Guadalupe, the Teatro de la Paz, the very extensive and fine furniture factory of Jorge Unna & Co. and the tobacco factory of Don Antonio Delgado Renteria. The evening brought a serenade on the Plaza de Armas, which was handsomely illuminated, followed by a brilliant ball at the Lonja club house of the Sociedad Potosina.

Early in the morning the engineers found themselves at Cardenas, on the way to the port of Tampico, the San Ysidro Valley having been passed through. Soon after the train entered the great cañon of the Tamsopo, fringing its one wall in a series of curves and tunnels—a splendid piece of engineering. The steep slopes of the cañon are heavily wooded, the bare cliffs rising on every side. At the mouth of the cañon lie the tropical low lands. A stop was made to view the charming upper pool of the El Abra Falls, and toward the evening a visit was made to the fantastic Choy Cave, the train reaching La Barra, beyond Tampico, in time in the evening to permit of a stroll along the beach of the Gulf in the moonlight. Extensive jetties have been extended into the sea at the bar, about 6 miles from Tampico, permitting the entrance of ships drawing from 18 to 21 feet of water.

Having thus in one day descended from the great plateau of Mexico to the tropics, many engineers were up at sunrise on Sunday for a plunge into the breakers,

in spite of warnings of the risk of encountering sharks. Toward the afternoon the party resumed their journey.

After the somewhat exciting descent of Saturday, a new experience awaited the engineers on the Monterrey & Mexican Gulf Railway, which extends from Tampico to Monterrey and beyond. This railroad has had a checkered career, having at one time been in the control of Belgian capitalists. A few days before the institute reached Tampico the road was transferred to the interests controlling the Mexican Central Railroad. The heavy cars of the trains swayed ominously in running over what has been a long neglected road bed, and it was many hours after the appointed time that the trains steamed into the station of Monterrey, where two military bands had long awaited their arrival. Incidentally it may be remarked that locally the Mexicans seem to prefer the spelling of Monterrey, which differs somewhat from the "Monterey" to which we are accustomed.

Monterrey

is a large town, nestling at the foot of Saddleback Mountain and other sharply defined limestone mountains. It boasts with justice of being the industrial center of Northern Mexico. It is the center of a large mining territory, not only handling the ores in the local smelters, but also distributing the supplies to the miners. A local brewery is building a glass works, and there are in operation and under construction a number of brickyards. The town has a large colony of American engineers and merchants, and in many respects is the most Americanized of Mexican towns.

In the afternoon the party visited the Monterrey plant of the American Smelting & Refining Company known as Smelter No. 3, which confines its operations to the production of argentiferous base bullion, and the works of the Monterrey Smelting & Refining Company known as Smelter No. 2. The latter, which is controlled entirely by Mexican capital, is equipped not alone for lead smelting, but also for the desilverization of base bullion by a modification of the Parkes zinc process, and for the parting of dore bars by the Moebius process. To the majority of the engineers, however, the most interesting and almost startling development of Monterrey was the large steel plant which is now under construction there. The Cia. Fundidora de Fierro y Acero de Monterrey, S. A., is a concern organized by Mexican and French capital, the principal interest being held by the estate of Patricio Milmo. It has a capital of $15,000,000, Mexican, of which about 35 per cent. has been called. The layout is exceedingly fine, the consulting engineer being William White, Jr., of Pittsburgh. Since we shall print a full account of the plant at an early date, it will only be necessary to state now that the work is progressing rapidly, and that what is being done is being carried through in the most substantial manner. The one point which the iron makers present discussed most eagerly was the future of the market for the products of the company in the Republic, and the sources of the supply of its raw materials.

In the evening the engineers in a body attended a ball tendered by the local committee at the Juarez Theater.

In the morning a special train carried the party for a visit to the Diente gorge, about 15 miles from the city. The mines are located high in the mountains, the tunnels opening at almost inaccessible points on the cliffs. The narrow valley which the railroad reaches is really only the shipping station for two of the mines, the Diente and the Zaragoza mines. In the case of both there are very interesting installations of wire rope tramways. The owners of the Diente mine, the Mexican Ore Company, an American enterprise, are building an incline. This concern also own the San Pedro and San Pablo mines in the district, and employ about 3000 men. The ore is a lead carbonate and gelena, carrying about 20 per cent. of lead, but only 3 to 12 ounces of silver.

At noon the party assembled at luncheon in the handsomely decorated pavilion of the Zaragoza mine. After a welcome from the Governor of the State of Nueve Leon, the party gave three rousing cheers for Carlos de Landero of Mexico, a representative of the institute, who was chiefly instrumental in perfecting the arrangements for the Mexican meeting.

The return to town had been so much delayed that only a little time was left for the last technical session of the institute. It was opened with a paper by Edwin Ludlow, general superintendent of the Mexican Coal & Coke Company of Barroteran, Coahuila, Mexico, on the Esperanzas coal field, which the institute was to visit the next day. This was followed by a very interesting paper by T. Witherbee of Durango, Mexico, on the Cerro de Mercado, the famous iron mountain of Durango.

In the evening three military bands gave a concert at the Plaza Zaragoza, followed by dancing at the Monterrey Casino, a very handsome club house.

During the night the trains proceeded to

Barroteran,

the scene of the operations of the Mexican Coal & Coke Company, which, under the management of Edwin Ludlow, have been developed in an incredibly short time. By borings a new coal basin has been developed very near to the older Sabinas Basin. A number of inclines have been sunk and equipped with machinery. A coal washing plant has been put in operation, and coking ovens have been built. The coke is better than any yet made in Mexico, and the 72-hour product finds a ready market with the lead and copper smelters.

Homeward Bound.

The trains reached the border toward dusk, and after passing the ordeal of the custom house sped on their way homeward. The second section spent an hour at Beaumont, Texas, in view of the oil field, the two trains reaching New Orleans in the night. At noon, after a morning's sightseeing, the journey was resumed over the Illinois Central Railroad, Chicago being reached after a splendid run. During the trip two interesting ceremonies took place in the different sections. In behalf of the party Prof. George E. Ladd of the Rolla School of Mines presented, in a very humorous speech, to Theodore Dwight an antique silver chest as a testimonial of their appreciation of his admirable work in connection with the trip. Mr. Dwight planned the itinerary, made all the arrangements for the special trains, the provisioning of the party, and conducted and managed the excursion without a single mishap. On the second train, W. E. C. Eustis of Boston, in behalf of his fellow passengers, in well chosen words, presented to E. W. Parker of New York two handsome pieces of silver. Mr. Parker had complete charge of the second train, and under somewhat trying circumstances, won the gratitude and admiration of all. After a few hours in Chicago those remaining in the party filling the first section resumed their journey to New York, arriving toward midnight on Sunday.

Thus there ended the most extensive and in many respects the most ambitious of all the many tours of the American Institute of Mining Engineers. One cannot help but feeling that the visit of so many experts to the neighboring republic is bound to lead to a very much clearer and better understanding of one another on the part of those living on one and the other side of the border. The hospitality of the Mexican people, the constant and tactful vigilance for their safety and their comfort on the part of the officials themselves and on the part of the railroad managers deeply impressed the visitors. In many respects the resources of the country and its progress in their development were a revelation. An enormous amount of work has been done, but it will take many years of peace and a continued influx of capital to open up the dormant riches. Relative to its population, the consuming capacity of the country is yet limited, and it is maybe a fair question whether the expansion of the needs of the great peon class of the population necessarily means increased happiness, from their point of view. That it will come, even though only slowly, seems inevitable. It is difficult for one brought up within surroundings so different to shake off what may be prejudice and the traveler is very apt to misjudge what he can only imperfectly understand. With our constant struggle for the very necessites of life, for food, and for shelter, we cannot appreciate the attitude of a people who need little hard work for the one, and

have almost no concern for the latter. Mexico's future depends upon internal peace. Those who are best qualified to speak, from a long residence in the country, insist that the money interests are so large now that disturbances are practically impossible. Although the majority of them must suffer from trouble, and are intensely wedded to present conditions, we must accept their verdict until events justify a modification of their views.

American Iron and Steel Statistics.

The annual report of the American Iron and Steel Association for 1900 has just been issued by James M. Swank, general manager, 261 South Fourth street, Philadelphia. The publication of this report has been delayed much beyond the usual time because the association has had in hand simultaneously the preparation of the *Directory of the Iron and Steel Works*, to be issued in a few weeks. The presentation of statistical information relating to the American iron trade has not been seriously delayed, however, as the statistics of various in-branches of trade have been published from time to time in the *Bulletin* as fast as collected from the manufacturers. The report gives the information in much greater detail than the preliminary figures thus published. In addition to domestic figures of production the report gives a summary of the production of iron and steel, iron ore and coal in all foreign countries in 1899 and 1900. Canadian statistics for 1900 are full and complete. Forming a part of the report and occupying 28 pages is a paper prepared for the United States Geological Survey, which is devoted to a review of the progress made by the world's iron and steel industries down to the close of the nineteenth century. A valuable feature of this paper is a chronological record of the development of the iron and steel industries of the United States from 1619 to 1900, giving the principal events in that development and a summary of the grand results. Liberal extracts from the report relating to domestic production are given below:

Production of Pig Iron.

Twenty-one States made pig iron in 1900, the same number as in 1899. The total production of pig iron in 1900 was 13,789,242 gross tons, against 13,620,703 tons in 1899, 11,773,934 tons in 1898 and 9,652,680 tons in 1897. The production in 1900 was 168,539 tons larger than in 1899.

The production of pig iron in the second half of 1899 and the first half of 1900 aggregated 14,974,105 tons, or almost 15,000,000 tons. The production in the second half of 1899 was 1,042,369 tons larger than in the first half, but the production in the second half of 1900 was 1,495,896 tons less than in the first half. The large production in the second half of 1899 and the first half of 1900 was due to the extraordinary demand accompanying and following the boom of 1899, and the decline in production in the second half of 1900 was due to the subsidence of the boom.

In the first half of 1901, however, there was again an increase in the production of pig iron, the output in that period amounting to 7,674,613 tons, or many thousand tons more than in either the second half of 1899 or the first half of 1900. The present year promises to yield a total production in round numbers of 15,500,000 tons. We estimate the value at the furnace of the pig iron product of 1900 as amounting to $259,944,000.

Production of Bessemer Steel.

The total production of Bessemer steel in the United States in 1900 was 6,684,770 gross tons, against 7,586,354 tons in 1899, showing a decrease in 1900 of 901,584 tons, or almost 12 per cent. The production of 1899 was the largest in our history. Of the production in 1900, 6467 tons were steel castings, against a similar production in 1899 of 3939 tons.

Production of Open Hearth Steel.

The total production of open hearth steel in the United States in 1900, including steel castings, was 3,398,135 gross tons, against 2,947,316 tons in 1899, an increase of 450,819 tons, or over 15 per cent. Our production of open hearth steel has more than doubled in the last four years.

In 1899 the production of open hearth steel by the basic process amounted to 2,080,426 tons and by the acid process to 866,890 tons. In 1900 2,545,091 tons were made by the basic process and 853,044 tons were made by the acid process.

Production of Crucible Steel.

The production of crucible steel in the United States in 1900 amounted to 100,562 gross tons, against 101,213 tons in 1899, 89,747 tons in 1898, 69,959 tons in 1897, 60,689 tons in 1896, 67,666 tons in 1895, 51,702 tons in 1894 and 63,613 tons in 1893. Ten States made crucible steel in 1900—namely, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Tennessee, Ohio, Indiana, Illinois and Wisconsin. The direct castings produced in 1900 by the crucible process, included above, amounted to 3989 tons. As usual, Pennsylvania made about three-fourths of the country's total crucible steel production in 1900.

Production of Miscellaneous Steel.

The production of steel in the United States in 1900 by various minor processes amounted to 4862 gross tons, almost all of which was in the form of direct castings, against 4974 tons in 1899, 3801 tons in 1898, 3012 tons in 1897, 2394 tons in 1896, 858 tons in 1895, 4081 tons in 1894, 2806 tons in 1893, 4548 tons in 1892 and 4484 tons in 1891.

Total Production of Steel.

The production of all kinds of steel in the United States in 1900 was as follows: Bessemer steel, 6,684,770 gross tons; open hearth steel, 3,398,135 tons; crucible steel, 100,562 tons; all other steel, 4862 tons; total, 10,188,329 tons, against 10,639,857 tons in 1899, a decline of 451,528 tons. Included in the figures given for 1900 are 192,803 tons of direct steel castings.

Production of All Kinds of Rails.

The production of Bessemer steel rails by the producers of Bessemer steel ingots in 1900 was 2,361,921 gross tons, against a similar production in 1899 of 2,240,767 tons and 1,955,427 tons in 1898. The maximum production of Bessemer steel rails by the producers of Bessemer steel ingots was reached in 1900. The year of next largest production was 1899. In 1887, 13 years ago, 2,044,819 tons were made. This was the third year of largest production.

Production of Iron and Steel Structural Shapes.

Our statistics of iron and steel structural shapes embrace the production of beams, beam girders, zee bars, tees, channels, angles and other structural forms, but they do not include plate girders made from plates. Plates are provided for under other classifications, and under the general statistics of plates are included all plates cut to specifications. Nearly all the structural shapes and plates used for structural purposes are made of steel. The total production of strictly structural shapes in 1899 was 850,376 gross tons and in 1900 it was 815,161 tons.

Production of Wire Rods.

The production of iron and steel wire rods in the United States in 1900 amounted to 846,291 gross tons, against 1,036,398 tons in 1899 and 1,071,683 tons in 1898, showing a decrease of 190,107 tons, or over 18 per cent., in 1900 as compared with 1899. Of the total production in 1900 1929 tons were iron rods and 844,362 tons were steel rods.

Pennsylvania made the largest quantity of wire rods in 1900, with Illinois second, Ohio third and Massachusetts fourth. Six other States—Connecticut, New York, New Jersey, Kentucky, Alabama and Indiana—also rolled wire rods in 1900.

Production of Tin Plates.

The duty on tin plates and terne plates provided for in the tariff act of 1890 went into effect on July 1, 1891. From that date until the close of the fiscal year ending on June 30, 1897, the statistics of our production of tin plates and terne plates were regularly collected for the

Treasury Department by Colonel Ira Ayer, special agent. For the second half of 1897 and the year 1898 they were collected by *The Metal Worker* of New York, and for 1899 and 1900 they have been collected by the American Iron and Steel Association. From the data thus obtained we have compiled the following table in gross tons of our production of tin plates and terne plates in the calendar years 1891 to 1900, the figures for 1891 being for the last six months only. The production of dipping plants is included in the figures given:

Calendar years.	Gross tons.	Calendar years.	Gross tons.
1891 (last six months).	999	1896	160,362
1892	18,803	1897	256,598
1893	55,182	1898	326,915
1894	74,260	1899	360,875
1895	113,666	1900	302,665

Production of Plates and Sheets.

The production of plate and sheet iron and steel in the United States in 1900, excluding nail plate, amounted to 1,794,528 gross tons, against 1,903,505 tons in 1899. Skelp iron and steel are not included in our statistics of plates and sheets, but are classed with other rolled products.

Production of All Rolled Iron and Steel.

The production of all iron and steel rolled into finished forms in the United States in 1900 was 9,487,443 gross tons, against 10,294,419 tons in 1899, a decrease of 806,976 tons, or over 7.8 per cent. It has been impossible for many years to separate rolled iron from rolled steel for statistical purposes, but the use of puddled iron in this country has been increasing in late years.

Summary of Statistics for 1899 *and* 1900.

Subjects.	1899.	1900.
Production of pig iron, gross tons	13,620,703	13,789,242
Production of spiegeleisen and ferromanganese, included in pig iron, gross tons	219,768	255,977
Production of bar, hoop, skelp, &c., not including wire rods, gross tons.	4,146,425	3,575,536
Production of iron and steel wire rods, gross tons	1,036,398	846,291
Production of iron and steel structural shapes, gross tons	850,376	815,161
Production of plate and sheet iron and steel, except nail plate, gross tons	1,903,505	1,794,528
Production of iron and steel cut nails and cut spikes, kegs of 100 pounds.	1,904,340	1,573,494
Production of iron and steel wire nails, kegs of 100 pounds	7,618,130	7,233,979
Production of all rolled iron and steel, including cut nails and excluding rails, gross tons	8,021,719	7,101,761
Production of all rolled iron and steel, including both cut nails and rails, gross tons	10,294,419	9,487,443
Production of Bessemer steel rails, gross tons	2,270,585	2,383,654
Production of open hearth steel rails, gross tons	523	1,333
Production of iron rails, gross tons	1,592	695
Production of all kinds of rails, gross tons	2,272,700	2,385,682
Production of street rails, included above, gross tons	154,246	101,312
Production of Bessemer steel, gross tons	7,586,354	6,684,770
Production of open hearth steel castings, gross tons	169,729	177,491
Production of all open hearth steel, gross tons	2,947,316	3,398,135
Production of crucible steel, gross tons	101,213	100,562
Production of blister and patented steel, gross tons	4,974	4,862
Production of all kinds of steel, gross tons	10,639,857	10,188,329
Production of ore, pig and scrap blooms for sale, gross tons	13,074	12,947
Production of tin plates and terne plates, gross tons	360,875	302,665
Value of imports of iron and steel	$15,800,579	$20,443,908
Value of exports of iron and steel	$105,690,047	$129,633,480
Production of iron ore, gross tons	24,683,173	27,553,161
Imports of iron ore, gross tons	674,082	897,831
Production of all kinds of coal, gross tons	226,553,564	240,965,917
Production of coke, net tons	19,668,569	20,533,348
Shipments of Pennsylvania anthracite, gross tons	47,665,204	45,107,484
Imports of coal, gross tons	1,400,522	1,909,276
Exports of coal, gross tons	5,752,150	7,917,519
Steel vessels built in the year ended June 30	91	90
Miles of new railroad completed	4,512	4,157
Immigrants in the year ended December 31	361,318	472,126

New Dry Dock at Baltimore.

The Wm. Skinner & Sons Shipbuilding & Dry Dock Company of Baltimore, Md., last week opened their new dry dock. It is one of the largest in the country, and is capable of docking any vessel of 600 feet in length and 70 feet beam, with a shaft of 22½ feet. The basin is constructed of timber, supported on piling, and the entrance is of granite masonry backed with Portland cement concrete. The gate is a steel caisson, giving an opening of 75 feet 8 inches at the low water line, with a depth of water on sill of 22½ feet. The dock will be filled through six 36-inch valves in the caisson, and emptied by three 36-inch centrifugal pumps of a capacity of 105,000 gallons per minute. They will empty the dock in one and a half hours. To care for the leakage a 14-inch centrifugal pump has been provided. The boiler plant consists of three 350 horse-power water tube boilers, which will furnish steam for the engines of the main pumps and one auxiliary tubular boiler for the supply of the drainage and caisson pumps and draft fans, also for the pumps furnishing water for washing out the dock and for fire protection. The principal dimensions of the dock are as follows: Length over all, 628 feet; width on floor, 62 feet; width at top of keel blocks, 69 feet; width at top of dock, 125 feet; entrance at bottom, 60 feet; entrance at top, 80 feet; depth of water on sill at low water, 22½ feet; depth of water on sill at high water, 25 feet. There are four chutes for delivering material into the dock, and every facility for handling and transferring it from one part of the plant to another. The plans and specifications were prepared and the work of construction superintended by James Ritchie and C. P. Ruple, civil engineers of Cleveland, Ohio; the specifications and general plans of the pumping plant were prepared by C. L. Reeder, mechanical engineer of Baltimore, Md.; the contractors for the several parts of the work being the following: Excavation, piling, masonry and timber work, Delaware Construction Company of Wilmington, Del.; pumps and engines, Morris Machine Company of Baldwinsville, N. Y.; boilers, Heine Safety Boiler Company of St. Louis, Mo.; steel caisson, Spedden Shipbuilding Company of Baltimore, Md.; power house superstruction, C. H. Fath & Son of Cleveland, Ohio; steam and water piping, Wallace Stebbins & Sons of Baltimore, Md.

The New Western Shipyard.—The Columbia Iron Works, Port Huron, Mich., recently incorporated, have acquired land south of St. Clair, having a frontage on the St. Clair River of 1700 feet, where ground will be broken this week preparatory to the installing of a modern shipbuilding plant. The company have plans drawn for two steel steamers, one for the Port Huron & Duluth Steamship Company of Port Huron, the dimensions of which will be: Length over all, 405 feet; beam, 50 feet, and depth, 30 feet; to be fitted as a package freighter; the other to be a lumber barge for Cleveland parties, the dimensions of which will be: Length over all, 180 feet, and beam, 40 feet. They also contemplate building several package freight boats for the Port Huron & Duluth Steamship Company. These boats are to be built on a new design, as far as the water bottom is concerned, the arrangement being such as to avoid the shoveling of grain and the trimming of coal, the full plans and specifications for which were drawn by the company's architect, Professor Durand of Cornell University. They expect to lay the keel for the first boat some time before March 1. As stated in these columns recently, the Columbia Iron Works and the Port Huron & Duluth Steamship Company are owned by the same parties. The president of both companies is J. E. Botsford, to whom all communications relative to the new company should be addressed.

There is a movement on foot in Anderson, Ind., to take up the old Arrow Company's plant and put in a wire mill of 50 tons capacity.

Plant Extensions of Colorado Fuel & Iron Company.

We are officially advised by the Colorado Fuel & Iron Company of Denver, Col., that the new tin plate department to be erected at their plant will consist of ten hot mills and the sheet department of eight mills. Early last month ground was broken for the erection of the 600 to 700 ton rod mill of the Garrett type, and wire mill to take care of its output. Other improvements now under way consist of two 95-foot blast furnaces, six 50-ton open hearth furnaces, new Bessemer department of 2000 tons capacity, 40-inch blooming mill, 24-inch reversing mill, 12 and 14 inch continuous hoop and small merchant mill. Changes are also being made in the rail mill to bring it up to the capacity required by the new Bessemer department. The present output of the steel plant is close to 1000 tons per day, and that of pig iron has been increased to a like amount by the new furnace, which went into blast in the early fall. With the two additional blast furnaces now under course of erection, one of which will probably go into blast about April and the other by midsummer, the capacity of pig iron will be increased to 2000 tons per day. Business with the company is very heavy, the orders running well into next year.

The Maryland Sheet Steel Company.—The Maryland Sheet Steel Company have been organized and have purchased from the Crucible Steel Company of America the plant formerly operated by the Cumberland Steel & Tin Plate Company, at Cumberland, Md. The crucible steel portion of the plant will be dismantled. The remainder of the plant will be operated. The equipment consists of a 15-ton open hearth steel furnace, a 16-inch three-high sheet bar mill and four sheet mills, two with rolls 40 inches long, and two with rolls 56 inches long, all being 26 inches in diameter. It is the intention to make open hearth steel, casting small ingots and rolling them into slabs on the bar mill for the sheet mills, which will produce heavy gauge sheets, from 9 to 18 gauge. There is a forging plant of five hammers, which will also be operated. The company have a paid up capital stock of $100,000, which covers the purchase price of the plant. The directors are A. F. Baumgarten, H. H. Dickey, H. E. Weber, H. E. Henderson and Nathan A. Taylor. Mr. Baumgarten has an office in the Park Building, Pittsburgh, which will probably be the sales office of the company. H. H. Dickey is one of the former owners of the plant, and Nathan A. Taylor is of N. & G. Taylor Company, Philadelphia, whose black plate plant adjoins the company's plant.

More Bonds to Carnegie Employees.—Last week 15 foremen and minor superintendents of departments at the Edgar Thomson steel works and blast furnaces of the Carnegie Steel Company, at Bessemer, were given blocks of stock in the United States Steel Corporation. The distribution was made by Thomas Morrison, general superintendent, and among those receiving stock were a boss painter, who has seen 20 years of service; a labor foreman for the last 23 years, a boss blacksmith for 17 years, two master rollers in the roll mills of the rail plant for a term of 21 years, two foremen of the converting mills for a period each of 20 years. Four of the seven foremen at the nine blast furnaces were given stock.

Joseph T. Ryerson & Son, Chicago, have let contracts for new warehouses to cover ground area approximately 250 x 250 feet, in addition to improving their present warehouses at Lake and Clinton streets and Milwaukee avenue. The new building will largely increase the ability of the company to handle their business, and will give them, it is said, by far the most extensive iron and steel warehouses in this country. All their warehouses, old and new, will be equipped with most modern appliances for the rapid and economical handling of material. Electric cranes, hoists, cold saws and other machinery will be installed to take care of material in which the company deal. New lines are to be added shortly, including a complete stock of bars, beams, channels, angles and other structural material.

PERSONAL.

Sir Christopher Furness, connected with very large shipbuilding and iron interests in England, who has spent a number of weeks visiting important industrial sections in this country, has returned to England. He sailed on Tuesday a passenger of the "Kronprinz Wilhelm." While here it was reported that he intended erecting a great shipbuilding establishment, but this he denied.

The Cambria Steel Company announce the appointment of V. S. Doebler as superintendent of transportation. Mr. Doebler was formerly a supervisor on the Pennsylvania Railroad's main line.

John W. Dougherty has been appointed superintendent of the Pennsylvania Steel Company's plant at Steelton, Pa., in succession to H. H. Campbell, who has resigned the superintendency of the works, but remains as general manager. Mr. Dougherty was for some years assistant superintendent under Mr. Campbell. Frank D. Carney, formerly engineer of tests at the steel works, has become assistant superintendent.

Frank Ryman has resigned as general superintendent of the mills of the Oliver Iron & Steel Company, at Pittsburgh, to assume the position of president of the New Castle Forge & Bolt Company, now erecting a plant at New Castle, Pa.

James Means, division freight agent of the Pittsburgh, Cincinnati, Chicago & St. Louis Railroad, better known as the Panhandle, at Pittsburgh, will be retired from active service January 1 under the regulations of the pension system of the Pennsylvania lines. L. D. Lippincott will succeed him.

J. Sidney Dillon has been appointed chief draftsman at the Edgar Thomson Works to succeed Edward E. Slick, who is now chief engineer of all the plants of the American Steel Hoop Company.

William Bennett of Pittsburgh has been appointed superintendent of the new steel plant of Jacob S. Coxey, at Massillon.

L. C. Hanna of M. A. Hanna & Co. has been elected a director of the Republic Iron & Steel Company in place of Wm. B. Ridgely.

Nathan Werbaugh of the civil engineering corps of the Edgar Thomson Steel Works of the Carnegie Steel Company, has resigned and has connected himself in a similar capacity with the Union Steel Company, at Donora, Pa.

Alfred Kidder, who has been in charge of operations for Jones & Laughlins for years, has resigned, and is succeeded by Thos. Walters of the same company. Mr. Kidder is a well-known and important figure in lake mining concerns, and has served the Pittsburgh & Lake Angeline Company (Jones & Laughlins) for 37 years. Captain Walters has been superintendent of the company's Lake Angeline mine and of late in charge of their Mesaba work.

The Hecla Coke Company of Pittsburgh, operating in the Connellsville region, will build 300 new coke ovens and about 40 double dwelling houses for their workmen. At the present time the Hecla Coke Company have two coke works, one having 256 ovens and the other 500. The new 300 ovens will give the concern a total of 1056 ovens, making them one of the largest independent coke operators in the Connellsville region.

An interesting pamphlet reprinted from the *Genie Civil* has just been issued by Aug. Dutreux. It deals with the utilization of blast furnace gas in engines, M. Dutreux having very closely watched developments. The title of the brochure is "Utilisation Directe des Gaz des Hauts Fourneaux dans les Moteurs a Explosion."

MANUFACTURING.

Iron and Steel.

In the United States Circuit Court at Pittsburgh last week the Kane-Maloney Iron & Steel Company filed an answer to the petition in bankruptcy. Receivers have been appointed by the Common Pleas Court No. 2, and the answer alleged that the United States District Court has no jurisdiction in the case, and asked that the petition be dismissed.

The Columbiana Boiler Company, Columbiana, Ohio, manufacturers of heavy plate work of all kinds, have received an order from the Sharon Steel Company, Sharon, Pa., for 59 gas producers.

W. D. McKeefrey has been appointed trustee of the Continental Iron Company to succeed R. S. Henderson of Cleveland, who resigned. The new trustee was authorized to expend $30,000 in placing the mill at Wheatland, Pa., in first-class condition.

The Ohio Falls Iron Company, New Albany, Ind., advise us that they are in the market for the entire equipment for the new muck mill, bar mill and light rail mill which they are to erect on the property formerly occupied by the New Albany rail mill which they purchased from the De Pauw estate. These additions, with the other improvements now in course of construction, which include a new office and electric light plant, will about double the capacity of the plant.

W. W. Kurtz of Coatesville, Pa., will on the 16th inst. apply for a Pennsylvania charter for the Coatesville Iron & Steel Company, who will operate the Valley Iron Works of that city.

Bloom Furnace, at Bloom Switch, Ohio, blew in on the 2d inst.

The Cleveland Axle Mfg. Company of Canton, Ohio, whose plant was recently damaged by fire, will erect a new building, to be used as a forge shop, making the total length of their plant 300 feet. New machinery will be installed in the forge shop.

Anna Furnace of the Struthers Furnace Company, Cleveland, was blown out for relining on November 9.

The Pittsburgh Seamless Tube Company will soon put in operation the plant of the Atlantic Tube Company, at Beaver Falls, Pa., which they acquired some time since. The new company will issue $200,000 preferred stock, $300,000 common stock and $100,000 bonds. The plant has been sold subject to the old bonds, which have been nearly all exchanged for the new ones. A billet piercing apparatus, from the George A. Hogg Iron & Steel Foundry Company, Pittsburgh, is being installed, and other improvements are being made to the plant.

The Cambria Steel Company of Johnstown, Pa., have drawn plans for a new bolt, nut and axle plant, to be 850 x 1200 feet in size. The works are to supply material for the new steel car works to be built by the Cambria Steel Company.

Active work is now going on in the erection of the new plant of the Mathews Woven Wire Fence Company, to be erected at Donora, Pa., near the plant of the Union Steel Company, and from which concern the Mathews Woven Wire Fence Company will buy their wire. The concern will manufacture woven wire fencing and steel posts, and E. E. Mathews is president.

General Machinery.

As soon as the details of the plans are completed, the Federal Lead Company, Union Trust Building, St. Louis, Mo., will be in the market for the equipment for their new smelting plant. The company have purchased a tract of land near Alton, Ill., upon which they will erect a large smelter for the treatment of Missouri ores. Work on the plant will be begun at once and will be pushed to completion as early as possible.

The Baltimore & Ohio Railroad Company, Baltimore, Md., advise us that they have no intention of building locomotive and car shops at Defiance, Ohio, as reported, or anywhere else.

The Pittsburgh Twist Drill & Tool Company of Pittsburgh have been incorporated to manufacture machinery and tools.

A large amount of machine shop equipment will shortly be required by Kenney & Co. of Scottdale, Pa., manufacturers of coal mine and coke oven machinery, as they advise us that none of the equipment for their new shops has been purchased. Their plant, which was recently destroyed by fire, is to be rebuilt by a newly organized company under the same name and management as that of the former, but with a capacity three times greater. The capital of the new company is $125,000, all of which has been subscribed, and the officers are A. K. Stauffer, president; D. B. Stauft, secretary; Walter F. Stauffer, treasurer; T. C. Kenney, Robt. Skemp, E. A. Humphries, J. R. Smith, J. I. Dick, E. L. Rutherford, all of Scottdale, and Worth Kilpatrick of Connellsville, Pa. T. C. Kenney is general manager.

The Gilmore-Rollins Company, Minneapolis, Minn., manufacturers of Gil-Rol steam specialties, have let the contract for the erection of their new buildings on Lyndale avenue. These will consist of a machine shop, 50 x 75 feet, two stories, and a boiler house, 50 x 100 feet, both of brick.

The York Mfg. Company, York, Pa., have recently booked the following orders: 6-ton ice making plant for United Ice Companies of Asbury Park, N. J.; 7½-ton refrigerating machine, to Frazar & Co., New York City, for export to Japan; 50-ton can ice making plant and piping for 170,000 cubic feet of space for Union Market Company, Philadelphia, Pa.; 15-ton freezing system for Houston Packing Company, Houston, Texas; 7½-ton refrigerating machine for Hammond Ice Company, Hammond, La.; 35-ton ice making machine, for J. W. Taylor, Corinth, Miss.; 30-ton brine tank system for Henco Brewery, Spokane, Wash.; complete 20-ton can ice making plant, for Kentwood Ice & Bottle Works, Kentwood, La.; 50-ton ice making plant, for Galveston Red Snapper Company, Galveston, Texas; machinery for 10-ton ice making plant, for City Ice & Bottle Works, Georgetown, Texas; 25-ton ice plant for Pickrall & Holbrook, Winchester, Ky.; 220-ton double pipe brine cooler, for Anhaeuser-Busch Brewing Association, St. Louis, Mo.; machinery for 10-ton ice making plant, for Lockhart Water Works, Lockhart, Texas.

The United States Navy Yard at Mare Island, Cal., have recently equipped their construction department with a number of reversible pneumatic drills, manufactured by the Helwig Mfg. Company, St. Paul, Minn. This purchase was made after a thorough trial of their drill on its merits.

The Tyrone Foundry & Machine Company of Tyrone, Pa., were awarded the contract for the erection of a stone crushing plant for the Marquis Limestone & Clay Company of Newcastle, Pa., to have a crushing capacity of 1500 to 2000 tons of furnace stone per ten hours. The company have also in course of construction a five-jaw Morris improved stone crusher for the Blair Limestone Company, Limited, of Hollidaysburg, Pa.

The Globe Machinery & Supply Company, Des Moines, Iowa, are installing a complete machine shop and boiler shop in their warehouse. All the equipment has been purchased.

F. E. French, treasurer of the Chapman Double Ball Shafting Bearing Company, 176 Federal street, Boston, Mass., is negotiating with a number of capitalists of Worcester, Mass., for the organization of a company and the establishment of a large plant in that city to manufacture their double ball bearing shafting.

An entirely new plant, including machinery, boilers, engine, buildings, cars, &c., is required by the Aurora Mining Company of Joplin, Mo., whose plant at Oronogo, near that city, was recently swallowed up in a cave in which covers a space about 200 x 400 feet. The company are large producers of zinc.

Exclusive of the poles and dam for water power, the Keeseville, Ausable Chasm & Lake Champlain Railroad Company, Keeseville, N. Y., will be in the market for equipment for a complete electric light plant, with necessary water wheels, power house, &c. The company intend to build a plant sufficient to furnish 6000 16 candle-power incandescent and 100 2000 candle-power arc lights.

Regen Bros., Lynnville, Tenn., are in the market for some equipment for their new machine shop and carriage factory. Their plant, which was recently destroyed by fire, will be rebuilt as soon as possible.

The chief engineer of the Wheeling & Lake Erie Railway, at Cleveland, Ohio, is preparing plans for the erection at Navarre, Ohio, of a large machine shop and repair house. Shops at Columbia and Canton are to be consolidated at Navarre.

Charles McSherry of Marlin & Co., Incorporated, at Pittsburgh, will engage in the manufacture of sheet metal working machinery. Mr. McSherry will manufacture the Hercules shears, of which he is the inventor, and also other lines of sheet metal working machinery.

The Pittsburgh Shear Knife & Machine Company of Pittsburgh have completed a new steam hammer erecting equipment, 44 x 150 feet, and have commenced work on a one-story building, 60 x 150 feet, to be used as a shear knife department. They have very materially increased the capacity of their machine shop, and when present improvements have been finished the concern will have doubled their capacity for the manufacture of shear knives, steam hammers, punches and shears.

Boilers, Engines and Accessories.

The Sparger Milling Company, Bristol, Tenn., are in the market for a 100 horse-power tandem compound engine, boiler, pumps and condenser for the new flour mill they are erecting in that city. The company have been recently incorporated and are building a mill, 36 x 122 feet, four stories, with a capacity of 200 barrels per day. They are also erecting an elevator of 20,000 barrels capacity.

The Westinghouse Machine Company of East Pittsburgh are installing four engines in the new Frick building in Pittsburgh.

The Water Works Department of Cleveland, Ohio, have called for bids on six water tube boilers of 250 horse-power each, to be installed in the new pumping station now under construction.

Fires.

The planing mill of George W. Steele, Paterson, N. J., was destroyed by fire November 29. The loss is about $8000, partly covered by insurance.

The main plant, together with the wire drawing and galvanizing plant and copper department, of the Crawfordsville Wire & Nail Company, Crawfordsville, Ind., were last week destroyed by fire. The loss on buildings and machinery is estimated at about $150,000 and that on finished material at about $50,000. The plant has only been in operation a short time. It is understood that the plant will be rebuilt.

The fruit evaporating plant of Michael Doyle & Co., Rochester, N. Y., was burned November 29. The loss is about $50,000; insurance about $40,000.

The Clear River Woolen Mill, at Burrillville, 12 miles from Woonsocket, R. I., was burned November 29. The loss is about $120,000, partly covered by insurance. The weaving and finishing part of the plant was operated by Robert Wilcox, William Lacey and O. T. Inman, and the other departments by O. T. and Francis Inman. The property was owned by the J. O. Inman estate.

C. Hiltebrant's shipyard, at Kingston, N. Y., was last week destroyed by fire. The loss is about $7000, with about $5000 insurance.

The Enterprise Foundry Company, Kansas City, Mo., suffered a $3000 loss by fire November 22.

The large plant of the National Enameling & Stamping Company, on Metropolitan avenue, Brooklyn, N. Y., was destroyed by fire November 28.

The large cigar box and veneer factory of Wm. E. Uptergrove & Bro., on East Tenth street, New York City, was totally destroyed by fire November 28, entailing a loss of about $1,000,000. The plant will be rebuilt as soon as a settlement can be made with the insurance companies. The machinery for immediate requirements of the firm has been purchased.

Foundries.

The Malleable Iron Works, Lancaster, N. Y., are to be reorganized and the plant enlarged and improved. About $50,000 will be spent in repairs by the new company. They are not in the market for any equipment at present.

The Sinking Spring Foundry Company, Sinking Spring, Pa., are in the market for additional tumbling mills. The company recently completed several additions to their plant, doubling the capacity, and are making gray iron and gas stove castings.

A half interest in the El Paso Foundry & Machine Company, El Paso, Texas, has been purchased by J. S. Carey and A. H. Seep for $50,000. The plant will shortly be enlarged by the erection of a new foundry, 80 x 160 feet, and considerable new machinery will be installed in the machine shop.

The Sessions Foundry Company of Bristol, Conn., have just secured an order through a New York commission house for a lot of castings to be used at the Imperial Palace, Tokio, Japan. They are also making several hundred tons of castings on an order for shipment to Pittsburgh, Pa., which is rather remarkable, as Pittsburgh is supposed to be the center of the iron industry.

The Fort Pitt Malleable & Gray Iron Company of Pittsburgh will erect a new foundry at McKee's Rocks, in that city.

Meerbach & Schneider, Philadelphia, Pa., are in the market for the entire equipment for the large addition to their foundry which they are about to erect.

The Craig Shipbuilding Company of Toledo, Ohio, will erect a new foundry building.

Work is progressing rapidly on the new foundry now being erected for the Powers Foundry Company, Elkton, Md. The equipment has been purchased.

The Bessemer Foundry Company have been organized at Grove City, Pa., for the manufacture of gas engine castings and gray forge castings. The concern are erecting a building, 100 x 150 feet in size, which will be commanded by an electric traveling crane and fitted up with modern tools. The concern expect to employ from 30 to 50 men and will be ready to start within 60 days. Benjamin Spearman of Sharpsville has been elected president; A. Seaton, vice-president; W. H. Christy, secretary, and J. M. Albin, treasurer and general manager.

The Cannon Metal Wheel Works, Limited, Pontiac, Mich., have organized, with a capital stock of $300,000, for the manufacture of metal wheels, farm wagons, &c. They own a 20-acre plot of ground adjoining that city, and bounded on one side by the Detroit, Grand Haven & Milwaukee Railway and on the other side by the double track electric line to Detroit. Upon this tract they will erect a two-story brick building, 80 x 200 feet, which will be equipped with the most modern appliances. They will have a floor space of 16,000 square feet, in which they can work to advantage 300 men and turn out about 5000 wheels per year. The company have rented temporary quarters, which they will use until their new plant is completed. The officers are Mason W. Gray, president; Frank G. Jacobs, treasurer, and Thomas M. Little, secretary and general manager.

Bridges and Buildings.

The Virginia Bridge & Iron Company, Roanoke, Va., are and have been busy the whole year manufacturing railroad and highway bridges and other structural work. They have received a contract for a large coal tipple requiring about 500 tons of structural steel and also a viaduct from the Crozier Coal & Coke Company, Elkhoran, Va.

Hardware.

Clipper Lawn Mower Company, Norristown, Pa., are about to erect a plant 40 x 150 feet, three stories high, to help meet the growing demand for their Clipper hand and pony mowers.

Miscellaneous.

The Corundum Mining & Mfg. Company, Tree, Ga., have increased their capital stock from $500,000 to $750,000 and will in the spring double their output. Recently they discovered a large and very rich vein of corundum on their property.

The Empire Iron & Steel Company.—The following changes are reported in the Board of Directors of the Empire Iron & Steel Company: Mark T. Cox of Robert Winthrop & Co. elected in place of W. L. Sims, resigned; Charles H. Zehnder, late president of Dickson Mfg. Company, elected in place of E. K. Sumerwell, resigned, and David B. Gamble of Procter & Gamble, soap manufacturers, Cincinnati, in place of W. E. Scarritt, resigned.

A New Rivet Maker.—The Fort Pitt Forge Company, organized in Pittsburgh a few months since, and manufacturers of iron and steel forgings, bridge and roof bolts, general blacksmithing, &c., have installed a number of rivet machines and are now prepared to furnish rivets.

The new sheet plant being erected at New Comerstown, Ohio, by the Tuscora Steel Company is rapidly nearing completion. The main building, which is to contain four hot mills and their complement of cold mills is 110 x 256 feet, the galvanizing department, 50 x 120 feet, and the corrugating and roofing department 62 x 240 feet. The first two buildings are completed and awaiting the installation of the machinery, and work on the third is well advanced. There has been considerable delay in getting the equipment, and the plant will not be ready for operation as early as was expected. The product will be black and galvanized sheets.

The American Ship Building Company of Cleveland, Ohio, have closed a contract for another steamer. It will be built for A. E. Stewart, C. F. Beilman and others of Detroit, and will have a capacity of 5000 tons, being an exact duplicate of the "Colonial" and "Yosemite" recently turned out by the company. The new steamer will be 376 feet over all, 356 feet keel, 50 feet beam, 28 feet deep. She will have triple expansion engines with cylinders 18, 29 and 48 inches, with 40-inch stroke. Steam will be furnished by two Scotch boilers 13 feet 2 inches in diameter, and 11 1-3 feet long, to be allowed 165 pounds of steam. She will cost $250,000, and will be built at Bay City.

The Fore River Ship & Engine Company of Quincy, Mass., will enter the manufacture of gun forgings. The Ordnance Bureau of the Navy Department has awarded to the company a contract for 60 sets of nickel steel forgings for 3-inch rapid fire field guns, and 15 sets of steel forgings for 4-inch, 40 caliber rapid fire guns. Work will begin at once, as the company must commence delivery in 50 days and complete it in 150 days.

Jones & Laughlins, Limited, Pittsburgh, Pa., have appointed John Hall & Co., Limited, 95-97 Liberty street, New York City, their sole agents for England and Wales for the sale of their cold drawn and cold rolled steel and accessories. The English branch is Hall & Pickles, Manchester.

It is reported that another immense oil well has been struck at Baku, Russia, supplementing the great gusher which has been yielding 1,000,000 poods daily since November 17. The new gusher is almost as great a producer. The price of oil at Baku has fallen sharply in consequence of these strikes.

It is announced that the Philadelphia & Reading Coal & Iron Company have received so many large orders for anthracite coal for foreign shipment that they have decided to accept no more of such orders at present.

The Iron and Metal Trades.

The confidence in the future of the Iron market continues unabated and is justified by the fact that the majority of blast furnaces producing Foundry Iron are booked from four to six months ahead. While it is stated that many buyers were "tipped off" before the recent advance, the market is very firm and a disposition is developing, as a measure of protection to the furnaces, to ask a further moderate advance for prompt and early delivery.

There has been some improvement in the Coke supply to the furnaces, but it is not general as yet. On the other hand, Pig Iron has been accumulating at the furnaces to some extent from sheer inability to forward it to consumers. That Iron, of course, will flow into the proper channels later on.

Little was done last week in Bessemer and Basic Iron, but the trading interest is expected to cover its January requirements in a few days.

The scarcity of Steel continues very embarrassing to the rolling mills, which must purchase in the open market, and fancy prices are being paid for Billets in small quantities. Some relief has come through purchases for importation, but the quantities involved thus far are only small, and the business is so close that special circumstances only warrant it. In some instances larger transactions have fallen through because domestic producers will take care of the mills who did the figuring. Still, some Steel has been sold into Illinois, after paying the duty of $6.72, which certainly reveals an extraordinary condition of affairs. Report has it that the German Basic Bessemer Billets can be laid down as low as $25.50, and Basic Open Hearth at $26.80, tidewater, duty paid, but the latest accounts are to the effect that the market abroad has hardened somewhat. It is likely that 2-inch Billets, for which capacity in this country is somewhat limited, while it is a common size in Europe, might be placed successfully, subject to a continuance of low freight rates. Relief in the Steel situation would be welcome.

There are inquiries in the market again, in the West, for round lots of Steel Rails, and some business has been done. To date the sales of Standard Steel Rails for 1901 delivery figure up 1,368,000 tons, which does not include the tonnage for electric lines, nor the quantity to be carried over from this year.

In the Plate trade the only large sale is a lot of 4000 tons for a boat to be built on the Atlantic coast. The Eastern Plate mill consolidation may not be carried through after all. A meeting is to be held to-morrow, which is expected to settle the matter, the chances being rather against it.

In some lines of Finished Iron and Steel the market shows an easier tendency. Bars are not quite as firm as they were. Possibly the enormous capacity of the modern mills is beginning to tell. Concessions to a moderate extent are being made on Sheets. In the Wire Nail trade prices are giving way slowly under the pressure of outside competition. For some time past this struggle has been confined to certain localities. The indications are, however, that now it is spreading.

The Tin boom has collapsed and the metal is back to 24.50 cents after soaring to 33 cents. Copper is in an extremely critical position, but as yet the decline is confined to the London market.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

	Dec. 4, 1901.	Nov 27, 1901.	Nov. 6, 1901	Nov 28, 1900
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia	**$15.50**	$15.50	$15.25	$15 50
Foundry Pig, No. 2, Southern, Cincinnati	**14.25**	14.25	13.75	13.75
Foundry Pig, No. 2, Local, Chicago	**15.50**	15.00	14.75	14.50
Bessemer Pig, Pittsburgh	16 00	16.00	16.00	13.75
Gray Forge, Pittsburgh	**14.75**	14.75	14.10	13 25
Lake Superior Charcoal, Chicago	**17.50**	17.00	17.00	18 50
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh (nom)	28 00	27.00	27.00	19.75
Steel Billets, Philadelphia (nom)	28.00	29.00	28.00	21.00
Steel Billets, Chicago, (nom)				20 75
Wire Rods (delivered)	35.00	35.50	35.00	33 00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	26 00
Spikes, Tidewater	2.00	2.00	1 80	1 50
Splice Bars, Tidewater	1.65	1 65	1.50	1 35
OLD MATERIAL, PER GROSS TON:				
O. Steel Rails, Chicago	14.00	14.00	14.00	11.00
O. Steel Rails, Philadelphia	**17.50**	17.50	17.00	15.50
O. Iron Rails, Chicago	21.00	21.00	21.00	17.50
O. Iron Rails, Philadelphia	**21.50**	21.50	21 00	17 50
O. Car Wheels, Chicago	15.50	15.50	16 00	16.00
O. Car Wheels, Philadelphia (nom)	**16.25**	16.00	16 00	16.50
Heavy Steel Scrap, Chicago	13.50	13.50	13 50	10.50
FINISHED IRON AND STEEL, PER POUND:				
Refined Iron Bars, Philadelphia	1.65	1 65	1 65	1 40
Common Iron Bars, Chicago	1 65	1.65	1 70	1 45
Common Iron Bars, Youngstown	1.55	1 55	1 60	1 30
Steel Bars, Tidewater	1.70	1 70	1 62½	1.40
Steel Bars, Pittsburgh	1.50	1.50	1.50	1 25
Tank Plates, Tidewater	1.75	1.75	1 75	1 50
Tank Plates, Pittsburgh	1.60	1 60	1 60	1.35
Beams, Tidewater	1.75	1 75	1.75	1 65
Beams, Pittsburgh	1.60	1.60	1.60	1.50
Angles, Tidewater	1.75	1.75	1.75	1.55
Angles, Pittsburgh	1.60	1 60	1.60	1 40
Skelp, Grooved Iron, Pittsburgh	1 80	1 80	1 80	1 50
Skelp, Sheared Iron, Pittsburgh	1.85	1.85	1 85	1 60
Sheets, No. 27, Pittsburgh	*2.90*	3.00	3.00	2.75
Barb Wire, f.o b. Pittsburgh	2.90	2 90	2 90	2 80
Wire Nails, f.o.b. Pittsburgh	*2.05*	2 15	2.20	2.20
Cut Nails, Pittsburgh	2.05	2.05	2 05	1.95
METALS:				
Copper, New York (nom)	*16.50*	16 75	16 85	16.75
Spelter, St. Louis	**4.20**	4.15	4.12½	4.15
Lead, New York	4.37½	4.37½	4.37½	4.37½
Lead, St. Louis	4.25	4.25	4.25	4.23½
Tin, New York	*24.50*	33.00	24 60	28.25
Antimony, Hallett, New York	8.37½	8.37½	8 37½	9.50
Nickel, New York	60.00	60.00	60.00	55.00
Tin Plate, Domestic Bessemer, 100 lbs., New York	4.19	4.19	4.19	4.19

Chicago.

FISHER BUILDING, December 4, 1901.—(*By Telegraph.*)

The most alarming feature of the Western trade is the continued scarcity of Coke, which is seriously curtailing the production of Pig Iron and to a lesser degree interfering also with the output of Steel. At this writing three furnaces are banked and two others are waiting for a sufficient stock of Coke to start up. It is believed that relief will come with the close of navigation, which cannot be delayed much longer. The motive power engaged in the lake trade it is thought will then be diverted very largely to the movement of Coke and thus give renewed life to the Western metal trade. The switchmen's strike at Pittsburgh also is exerting an unfavorable influence upon the market here by diminishing the receipts from that district. In several lines the restriction in receipts is traceable to that source. On the whole demand is somewhat in excess of receipts, and production, and consequently stocks, are suffering. This condition exists in the face of a reduced demand, especially in the jobbing trade on account of the inventory which is in progress and on account of preholiday quiet. There is fair trading in all branches of trade, the reasonable dullness being offset quite largely by a continuation of abnormally large consumption.

Pig Iron.—Melters of Pig Iron in this district have been driven to various expedients to keep their output

from impairment in the present Coke scarcity. A not uncommon expedient is the use of Anthracite Coal as a substitute for Coke, and foundrymen have been compelled also to resort to the partial use of off grades. Thus far it is not believed that the output of the foundries has been seriously affected by the Coke shortage, but an indefinite continuation of the present scarcity would lead to serious results. The local Pig Irons are considerably stronger; prices are 50c. higher than a week ago. The loss of Pig Iron by the idleness of furnaces runs up well into the thousands of tons, and this is making the tonnage of Iron due and undelivered quite formidable. There is a marked reluctance among local producers to sell Iron for prompt or nearby shipment, though for future deliveries beyond the probable influence of the Coke famine there is no hesitation in closing. A moderately large business has been transacted in lots running from 200 to 800 tons. One inquiry in the market is for 5000 tons and another for 4000 tons. Charcoal and Malleable Bessemer are considerably stronger. We quote as follows:

Lake Superior Charcoal	$18.00 to $19.00
Local Coke Foundry, No. 1	16.00 to 16.50
Local Coke Foundry, No. 2	15.50 to 16.00
Local Coke Foundry, No. 3	15.00 to 15.50
Local Scotch, No. 1	16.00 to 16.50
Ohio Strong Softeners, No. 1	17.25 to 17.50
Southern Silvery, according to Silicon	16.15 to 16.40
Southern Coke, No. 1	15.65 to 16.15
Southern Coke, No. 2	15.15 to 15.65
Southern Coke, No. 3	14.65 to 15.15
Southern Coke, No. 1 Soft	15.65 to 16.15
Southern Coke, No. 2 Soft	15.15 to 15.65
Foundry Forge	14.15 to 14.65
Southern Gray Forge	14.15 to 14.65
Southern Mottled	14.15 to 14.65
Southern Charcoal Softeners, according to Silicon	15.00 to 16.00
Tennessee Silicon Pig	16.40 to 16.65
Alabama and Georgia Car Wheel	19.50 to 20.50
Malleable Bessemer	17.00 to 17.50
Standard Bessemer	.... to 17.50
Jackson County and Kentucky Silvery, 8 per cent. Silicon	16.00 to 16.25

Bars.—There is only moderate activity in Bars. Jobbers are not buying because of inventory. Manufacturing consumers are taking fair lots, both for present needs and for a series of months. Prompt delivery is not possible, however, mills being sold for weeks ahead. Prices are without change. Mill shipments are 1.65c. for both Iron and Steel. From store quotations have settled down to about 1.90c. for both Common Iron and Soft Steel. Steel Hoops are strong at 2.50c., base.

Structural Material.—The market for Structural Material is most satisfactory. No large contracts are reported, but plans for several local buildings are under way and the amount of work on the books of architects is enormous. Deliveries are still heavy and the small trade is everywhere active. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c.; 18 inches and over, 1.85c.; Angles, 1.75c. rates; Tees, 1.80c.; Universal Plates, 1.75c. to 1.85c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.15c.

Plates.—The local mill will probably resume next week. The current trade is moderate, both from mill and store, but consumption is seasonably large. Mill shipments are quoted as follows: Tank Plate, ¼-inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.85c.; Marine, 1.95c. Jobbers are selling small lots from store at 1.90c. to 2c. for Tank, and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

Billets.—There are no Bessemer Billets for sale and the output of Open Hearth is sold ahead for several months. Prices for Open Hearth are $30 to $34, according to specifications.

Sheets.—There are many orders running up into several hundred tons each. Mills do not seem to be gaining upon their orders and are still several months behind. Orders placed last summer are now being delivered. Prices are without change, though ranging more widely than when supply is normal. No. 27 Common is quoted 3.50c. to 3.70c., and Galvanized, 65 and 10 to 70.

Merchant Pipe.—From mill, trade is down to the low ebb of December. Store trade locally is helped by the active building operations and aggregates a very fair tonnage. There is a slight revision of prices in the oil belt, but locally prices are without change. Carload lots are now quoted as follows, random lengths: Black, ⅛ to ½ inch, 60 off; ¾ to 10 inches, 67 off; Galvanized, ⅛ to ½ inch, 47 off; ¾ to 6 inches, 55 off.

Boiler Tubes.—There is continued activity in Boiler Tubes, with quotations firm. Quotations are as follows:

	Steel.	Iron.
2¾ to 5 inches	57½	47½
1¾ to 2½ inches	50	40
1 to 1½ inches	35	30
6 inches and larger	52½	45

Merchant Steel.—New business is moderate, many consuming manufacturers reducing stocks on hand at the close of the year to the lowest possible tonnage. Mills are hurried with accumulated orders, prices are steady. Mill shipments, Chicago, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.85c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 off in carload lots. Ordinary grades of Crucible Tool Steel are quoted at 6¾c. for carloads and 7c. to 7½c. from store; Specials, 12c. upward.

Rails and Track Supplies.—There are inquiries for 150,000 tons of Standard Sections, which might be placed were delivery possible. One current transaction is for 15,000 tons for next November shipment and that delivery is the basis of present trade. Most of the business closed for next year's shipments is for track relaying, few track extensions and new projects being included in the phenomenal tonnage placed. There is still good inquiry for Light Rails for early shipment, which, however, cannot be filled. Standard Sections are quoted at $28 and Light Rails $30.50 to $35. Track Fastenings are as follows: Splice Bars, 1.65c. to 1.75c.; Spikes, 2c. to 2.10c.; Track Bolts, with Hexagon Nuts, 2.90c. to 2.95c.; Square Nuts, 2.75c. to 2.80c.

Old Material.—The movement of Scrap this week is largely on old orders. There is a fair amount of new trading, but on the whole the trade is inclined to be quiet. Prices remain in great part unadjusted, and in some instances a week's trade shows a variation of several dollars according to the necessities of each case. Old Steel Rails, long lengths, are scarce and in brisk demand at strong prices. Iron Fish Plates and Car Axles are slightly lower. The following are approximate quotations per gross ton:

Old Iron Rails	$21.00 to $21.50
Old Steel Rails, mixed lengths	14.00 to 14.50
Old Steel Rails, long lengths	20.00 to 21.00
Heavy Relaying Rails	25.50 to 26.00
Old Car Wheels	15.50 to 16.00
Heavy Melting Steel Scrap	13.50 to 14.00
Mixed Steel	10.50 to 11.00

The following quotations are per net ton:

Iron Fish Plates	$16.00 to $16.50
Iron Car Axles	19.00 to 20.00
Steel Car Axles	18.00 to 18.50
No. 1 Railroad Wrought	15.00 to 15.50
No. 2 Railroad Wrought	13.25 to 13.75
Shafting	16.00 to 16.50
No. 1 Dealers' Forge	13.00 to 13.50
No. 1 Busheling and Wrought Pipe	11.50 to 12.00
Iron Axle Turnings	11.25 to 11.75
Soft Steel Axle Turnings	10.50 to 11.00
Machine Shop Turnings	9.50 to 10.00
Cast Borings	5.00 to 5.25
Mixed Borings, &c	5.25 to 5.50
No. 1 Boilers, cut	11.00 to 11.50
No. 2 Boilers, cut	10.00 to 10.50
Heavy Cast Scrap	11.00 to 11.50
Stove Plate and Light Cast Scrap	8.00 to 9.00
Railroad Malleable	12.50 to 13.00
Agricultural Malleable	11.50 to 12.00

Metals.—Because of the unsettled outlook for Copper transactions are limited to bare needs, but consumption is large and prices are unchanged. Tin is lower and other metals without quotable change. Carload lots of Lake are held at 17c., and Casting brands at 16½c. Pig Lead stands steadily at 4.32½c. for Desilverized and 4.42½c. for Corroding, in 50-ton lots. Dealers continue to quote selling prices on small lots of Old Metals as follows: Copper Wire and Heavy, 15c. to 15½c.; Copper Bottoms, 14c.; Pipe Lead, 4.15c.; Zinc, 2.75c.

Coke.—Buyers and sellers of Coke are alike suffering from the continued scarcity. It is simply impossible to fill contracts because of the inability of the railroads to carry the Coke produced. Consequently there is a demand for off grades and various substitutes. The ordinary quotation for Connellsville Crushed on regular business is $5 to $5.25, but holders of ready stock can obtain fancy prices.

Philadelphia.

FORREST BUILDING, December 3, 1901.

It is difficult to express any very positive opinions in regard to the Iron and Steel trades. Business is undoubtedly in first-class condition, and as far as can be seen it looks like continuing so for an indefinite period. Orders in hand from ultimate consumers are probably as large, if not larger, than they ever were, while stocks of material were never so small, considering the increased volume of business. Neither are prices excessive, and for a full year have varied so little that $1 per ton on Pig Iron would cover the extreme range of high and low, to-day's prices being practically the same as they were at this time a year ago. In the West there are some indications of an upward movement, but in the East a steady and unchanged market is about all that the trade looks for. In the more advanced products the feeling is somewhat less uniform. In some lines there is a great scarcity, with but little prospect of overcoming it unless there is a slackening up in the demand during the next two or three months. Bar and Plate specifications are not coming in as could be desired, but as cars are scarce it makes very little difference, as shipments could not be made in large volume, no matter how anxiously deliveries were called for. What the next four weeks will develop is a difficult question to answer. The capacity for production is so large that a falling off in demand would make itself felt very quickly, and some are inclined to think that Plates, Bars and Skelp are already drifting in that direction, but whether it is temporary or not remains to be seen. The consensus of opinion appears to be that the trade is in a very sound condition, but there are some influences which suggest extreme caution as regards prices. The loss of the export trade and the beginning of imports represent a remarkable change in other countries, and it is not safe to ignore facts of this character, although for the time being they have probably been helpful rather than otherwise. With such extreme scarcity as there has been here for several months past, it is hard to say where we would have been if we had kept on shipping 600,000 to 800,000 tons a year to other countries, and, while this is true, it does not by any means follow that we could stand imports to any extent. Our own production is steadily increasing, and if the entire tonnage can be marketed in the United States we ought to be amply satisfied, as the chances for export are for the present totally eliminated.

Pig Iron.—There has been a fair amount of business closed during the week, and a great deal more could have been done if makers had held out inducements. They are in so strong a position, however, that they would just as soon wait a while longer before making heavy commitments, as higher prices may yet be realized, while the chances of a decline are considered too slight to receive serious attention. Buyers take the view that while the chances of a decline are very small the chances of any permanent advance are not so strong as to lead to immediate purchases, and, moreover, they expect to be taken care of before any advance goes into effect, so that skirmishing for position fairly defines the situation at the present time. Stocks are so much reduced, however, that prompt shipments command extreme figures, say, $16 for No. 2 X, $15.50 for No. 2 Plain, and about $14.50 for Standard Gray Forge. For the first and second quarters of 1902 it is probable that about 50c. less would be accepted, but makers are so well fixed that they are biding their time, meanwhile protecting their trade by adapting their quotations according to quantity required, date for delivery, &c. On such a market it is difficult to give exact prices, but the range would be about as follows, the top figures being for early shipments for Philadelphia and nearby points: No. 1 X Foundry, $16.25 to $16.50; No. 2 X Foundry, $15.75 to $16; No. 2 Plain, $15.25 to $15.50; Standard Gray Forge, $14.25 to $14.50; Ordinary Gray Forge, $13.75 to $14; Basic (Chilled), about $14.25, and Besemer at $15.75 to $16.

Billets.—Prices are entirely nominal at about $28 to $29 for prompt shipments, and $25 to $26 for long deliveries, but in the absence of actual business prices are largely a matter of conjecture.

Muck Bars.—Prices are easier, and in a general way may be quoted at $27.50 to $27.75, f.o.b. cars, sellers' mills, but there is not much demand at the present time.

Plates.—The market is not particularly active, and some of the mills would be glad to see new business coming in, as they are getting pretty close to the end of their order books. The volume of business is very much larger than it was a year ago, but the greater capacity for production requires a constantly increasing demand to keep pace with production, consequently what would have taxed the mills to their utmost a year ago is now barely enough to go around. The general run of orders is for lots of 100, 200 or 300 tons each, but one order for 4000 tons was taken for a ship yard in the vicinity of New York. Prices unchanged as follows for Philadelphia and nearby deliveries: Universals, 1.75c. to 1.80c.; Sheared, 1.75c. to 1.80c.; Flange, 1.85c. to 1.95c.; Fire Box, 1.95c. to 2.05c.; Marine, 1.95c. to 2.05c; C. H. No. 1 Iron, 2.40c.; C. H. No. 2 Flange, 2.90c.; C. H. No. 1 Flange Fire Box, 3.40c.

Structural Material.—It is hardly worth while to say anything in regard to this interest, as mills are all full of work, and as far behind in deliveries as ever, so that there is no prospect of changed conditions for the present. Prices nominally as follows for seaboard or nearby deliveries: Angles, 1.75c. to 1.85c.; Beams and Channels, 15-inch and upward, 1.75c. to 1.85c.

Bars.—Somewhat peculiar conditions prevail in the Bar trade, but as regards prices there is no change. Mills in the association maintain absolutely firm prices, but one or two outside nearby concerns have been cutting about $1 a ton on some first-class business. The consequence is that some of the Eastern mills are a little short of work. They were running on Skelp, but as the demand has dropped off to small proportions they are left bare of orders, both for Skelp and Bars. There is a great deal of business in prospect, but not much chance of any great activity until after the turn of the year. Association prices are firm at 1.67½c. to 1.72½., delivered, for Iron Bars, Steel at 1.70c. to 1.75c.

Sheets.—There is plenty of business, but not as much pressure for deliveries as there was some time ago, although the mills are still a good deal behind with some of their orders. Prices for long deliveries would be quoted about as follows (Common Sheets two-tenths less): No. 10, 2.30c. to 2.40c.; No. 14, 2.50c.; No. 16, 2.70c.; Nos. 18-20, 3.20c.; Nos. 26, 27, 3.50c. to 3.60c.; No. 28, 3.80c. to 4c.

Old Material.—There is a good demand, and prices are firm with bids and offers for deliveries in buyer's yards as follows: Low Phosphorus Scrap, $21.50 to $22; Choice Railroad Scrap, $20 to $21; Country Scrap, $16 to $17; No. 2 Light (Ordinary), $12.50 to $12.75; No. 2 Light (Forge), $14 to $14.75; Machinery Cast, $14 to $14.50; Heavy Steel, $17.50 to $17.75; Old Steel Rails, short lengths, $17.50 to $17.75; Old Iron Rails, $21.50 to $22; Wrought Turnings, $12.75 to $13.25; Cast Borings, $8 to $8.25; Old Car Wheels, $16.25 to $16.75; Iron Axles, $24 to $25; Steel Axles, $19 to $20.

Cincinnati.

FIFTH AND MAIN STS., December 4, 1901 (*By Telegraph.*)

There has been but slight change in the general situation. Buying has not been so active as it was before prices were raised two weeks ago, but there has been nevertheless a fair run of orders averaging 200 to 500 tons. This from widely scattered consumers and from nearly all branches of the trade. Sellers are not pushing business and buyers will not be likely to seek much Iron from now until the first of the year, hence a seasonably quiet December is looked for. The great problem for all concerned is the shortage of cars and the difficulty in getting Iron moved is seemingly on the increase. There are now many cars of Iron in the railroad yards south of the Ohio River at this point which cannot be moved on account of the refusal of the Southern roads to send their cars North and the lack of cars on

the part of the Northern roads to send across the river for transfer of the freight. Northern Irons are a little higher. Southern brands unchanged. Freight from Birmingham is $2.75 to this point; from Hanging Rock district $1.10. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	.... to	$15.00
Southern Coke, No. 2	.... to	14.25
Southern Coke, No. 3	.... to	13.75
Southern Coke, No. 4	.... to	13.25
Southern Coke, No. 1 Soft	.... to	15.00
Southern Coke, No. 2 Soft	.... to	14.25
Southern Coke, Gray Forge	.... to	13.25
Southern Coke, Mottled	.... to	13.25
Ohio Silvery, No. 1	$15.60 to	16.10
Ohio Silvery, No. 2	15.10 to	15.60
Lake Superior Coke, No. 1	16.10 to	16.60
Lake Superior Coke, No. 2	15.60 to	16.10
Lake Superior Coke, No. 3	15.10 to	15.60
Southern Basic	.... to	14.75

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades	$18.25 to	$18.75
Standard Southern Car Wheel, No. 2	17.25 to	17.75
Lake Superior Car Wheel and Malleable	18.50 to	19.00

Plates and Bars.—The price-list is unchanged, but the feeling is that the tariff is being firmly held and a strong undertone exists. Trade is brightening up somewhat. Iron Bars have been placed on the same basis as Steel Bars and are quoted f.o.b. Cincinnati as follows: Iron Bars in carload lots, 1.60c. to 1.65c., with half extras; same in small lots, 1.65c. to 1.80c., with full extras. Steel Bars are same price as Iron Bars. Base Angles, in carload lots, 1.90c.; Plates, ¼-inch and heavier, 1.90c. to 2c.; 3-16 inch, 2.10c.; Sheets, No. 16, 2.90c. to 3c.

Old Material.—The market is practically unchanged. We quote dealers 'buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, per net ton, $14 to $14.75; Cast Railroad and Machine Scrap, $12.25 to $12.75; Iron Axles, $19 to $20; Iron Rails, $17.25 to $18.25; Steel Rails, rolling mill lengths, $14.75 to $15.25; short lengths, $13.75 to $14; Car Wheels, $16 to $17. All prices except No. 1 Wrought on the basis of gross tons.

St. Louis.

CHEMICAL BUILDING, December 4, 1901.—(*By Telegraph.*)

Pig Iron.—Transactions in the Pig Iron market continue along the same strong and consistent lines and the records of the volume of sales foot up about the same total as for several weeks back. The heaviest requirement coming to our notice since our last report is one estimated at about 2500 tons; aside from this order, 300 to 500 tons is about the average. The Coke transportation situation among the Southern furnaces is not showing any signs of improvement, it is said. We quote as follows for cash, f.o.b. St. Louis:

Southern, No. 1 Foundry	$15.50 to	$15.75
Southern, No. 2 Foundry	14.75 to	15.00
Southern, No. 3 Foundry	14.25 to	14.50
Southern, No. 4 Foundry	13.75 to	14.00
No. 1 Soft	15.25 to	15.50
No. 2 Soft	14.75 to	15.25
Gray Forge	13.75 to	14.00

Bars.—No new features can be noted in the market for Iron and Steel Bars, the same strong and active demand being reported by the mills. Among the jobbers a satisfactory feeling with the volume of demand is to be noted. We quote, from mill, Iron Bars at 1.70c. to 1.80c; Steel Bars at 2c. Jobbers quote Iron Bars at 2c. to 2.10c.; Steel at 2.10c. to 2.15c., full extras.

Rails and Track Supplies.—The Rail department of the market continues along the same lines as when last reported, and prices are without change. The market for Track Supplies is active and strong and prices are well maintained. We quote: Splice Bars, 1.75c. to 1.95c.; Bolts, with Square Nuts, 2.75c. to 2.90c.; with Hexagon Nuts, 2.90c. to 2.95c.; Spikes, 2c. to 2½c.

Angles and Channels.—A very satisfactory business for the season is in progress in the market for small Angles and Channels and prices are well maintained. Jobbers quote at 2.30c., base, for materials of this class.

Sheets.—The market for Sheets of all classes and sizes is active. Quotable prices are without change since our last report. Jobbers quote Stove Pipe size, No. 27, 3.45c. to 3.50c.; Galvanized Sheets, 65 and 10 off, and in round lots, 70 to 70 and 5 off.

Pig Lead.—No new features of note have shown themselves in the Pig Lead market. A quietness and the same range of prices rule. Soft Missouri from 4.25c. to 4.27½c., and Chemical, 4.30c. to 4.35c.

Spelter.—The Spelter market has shown great activity since our last report, and heavy transactions have been in order. Prices are higher, and at this time 4.20c. is bid, with light offerings, it is said, at this figure.

Cleveland.

CLEVELAND, OHIO, December 3, 1901.

Iron Ore.—The movement of Iron Ore for the season is about at an end. Most of the larger shippers have already withdrawn from the market and the others are taking what are known as cleaning up boats. The pockets in the Northwest are badly frozen, and it is with the greatest difficulty that any loads are obtained. This is one of the principal reasons for the near approach of the end of the season of Ore shipment, as there is a vast quantity of Ore which might be moved were it possible. The end is hurried also by the fact that all of the insurance policies on the larger Steel boats will expire with December 5, and boats will stop running perforce. During the week a few Escanaba "wild" charters have been taken at 90c., although others have been placed as low as 70c. to Ohio ports, by which prices the uncertainty and the weakness of the market are indicated. There is, in fact, such an abundance of tonnage for the material to be moved that the shippers are almost in position to dictate their own terms, as long as they do not make a prohibitive rate. Most of the Duluth and Marquette Ore cargoes have been taken care of by contract tonnage, but upon those cargoes which came down "wild" the old rates of $1.25 and $1.15, respectively, have been paid. The figures for November are not yet available, but it is quite certain that the showing will be of over 20,000,000 tons moved during the season.

Pig Iron.—Some most interesting developments have been noted in the Pig Iron trade during the week. The car shortage has continued to such a disastrous extent that production has been most seriously curtailed. The consumption has, in fact, been considerably in excess of production, and it has come to the point where, in trying to keep even with contracts, the furnaces have made deliveries out of stock, resulting in almost a complete depletion of the stock piles. The work of the stacks has been cut down to such an extent by the lack of Coke that, while the immediate effects are not felt now, it is feared in the trade that some serious results may appear later. The continued delay and the curtailment of production have strengthened the market until now many foundry producers are asking $15 in the Valley for No. 2, and are obtaining it without much difficulty. The conservative element, among the producers, is still asking $14.50 for No. 2 in the Valley, fearing to shut off the demand if the price advances too sharply. This same sentiment is dominating the Bessemer Association which, while able to advance prices at will, absolutely refuses to name a price better than $15.25 in the Valley. This will be the price at which all Bessemer for January delivery will be sold. Some good sized contracts have already been taken at that figure, and it is understood that some of the larger buyers are represented. Some small lots of Bessemer were sold recently at $15.50 in the Valley, but these sales were discouraged by the association, which is inclined toward a stability of price that business may not lag. The Basic producers have settled upon $15 in the Valley for their Iron, and this is being paid without much question. Enough Iron has been sold to establish this figure as the price at which Basic for January delivery will be sold. The old time differential between Bessemer and Basic is therefore destroyed. The market is strong and material scarce.

Finished Material.—Plates and Railroad Track Supplies have seemed to lead the market this week, the Plate trade being especially active. There has hardly been a time during the rush season in the market when the Universal Plate mills have not been oversold, but up until now Sheared Plates have been lagging some-

what, and the production seemed to be constantly gaining on the purchases. Until recently there was such a disparity between the ordering and the production that the market has been weak. With a number of ships recently taken by the American Ship Building Company, one of which was placed last Friday and one the following day, and with a number of the car building companies coming into the market for more material the outlook has brightened materially. The sales of ship material during the week, therefore, have been about 7000 tons, while the ordering for cars has brought the tonnage above that amount. The price is firm at 1.70c. The steam railroads are still buying Rails in finishing up lots, and there is a good stiff buying among the electric lines. Some mills are not inclined to take any further orders for the present, and are a little concerned as to how they are going to come out with their present contracts. This week the Wheeling & Lake Erie, the Lake Shore & Michigan Southern, the Nickel Plate and the Lake Erie & Western railroads have all purchased their Splices and other Track Supplies, and the orders have aggregated about 1000 tons, which is considered a very large tonnage for those supplies. The Bar trade continues active, with orders coming in constantly, enough so, in fact, to insure continued activity along those lines for some time to come. The prices hold at 1.50c., Pittsburgh, for Iron Bars; 1.50c., Pittsburgh, for Bessemer Steel Bars, and 1.60c., Pittsburgh, for Open Hearth Steel Bars. Structural Material continues to be in big demand, and contracts are now being made which entail deliveries during the first half of the year, with the possible output pretty well sold up. The quotations are still 1.70c.

Old Iron.—The buying of Scrap has been only fairly active during the week, and the market has been steady. The prices have not changed in the least, the quotations being as follows: No. 1 Wrought, $16.50 net; Cast Borings, $8 gross; Wrought Turnings, $12.25 gross; Cast Scrap, $13 net; Stove Plate, $10 net; Heavy Steel, $17 gross; Steel Rails, $17 gross; Old Iron Rails, $22 gross; Old Iron Axles, $19 gross; Old Car Wheels, $17 gross.

Birmingham.

BIRMINGHAM, ALA., December 2, 1901.

There has been no change in market quotations for Iron since last letter, and only little if any in surrounding conditions. The demand, though lacking the acuteness that has characterized it, is still sufficient to equal, if not exceed, in volume, the current output. The late advance in prices is well maintained, and there is very little "hectoring" over them. The trouble is to find a fissure vein in the stock supply of Iron, and cut out some for prompt delivery. There were several orders for 1000 tons completed, but the largest part of the business was in smaller lots. Importations for prompt shipment continue as heretofore, and there is great promptness in loading cars as rapidly as they are supplied. Gray Forge has been quoted of late at $10.75, while the sales made were principally at $10.50. When the advance of 75c. was established that grade was quoted at $10, but some sales were being made at $9.75. The advance, on account of the market strength, was added to the higher price, and the result was $10.75. Some sellers were satisfied, though, with $10.50, and that is the market. No. 2 Foundry sold at $11.50, and one 1000-ton lot of No. 3 Foundry at $11, while No. 4 Foundry, in like manner, went at $10.50. Gray Forge was in demand at $10.50, while a little went at $10.75. The Pipe works have been picking up No. 2 Soft at $11.50, but find it is in slim supply, as is also No. 1 Soft. The demand from the small buyers is for nearby delivery. Failing in that condition they accept what they can get. Delivery in second quarter, 1901, is the favorite option with sellers, as the first quarter is now so well sold up. As to the outlook, the demand prevailing for the season is so unusual that those inclined to be optimistic anticipate a hardening of the market with its continuance. The report of stocks for November, it is confidently felt, will show such a decrease that a further hardening of values will follow. The shipments of Pig Iron from this district from January to November 1 were 662,127 tons. Of Cast Iron Pipe they were 68,035 tons. The exports of Pig Iron (same period) were 21,236 tons, as against about 200,000 tons for 1900. Shipments of Steel Billets were about 50,000 tons. Commencing in January our shipments of crude Iron must necessarily fall off, because more of it will go into finished product here.

The Steel mill has suffered from a rush of orders it could not accept, as they exceeded ability to supply in time desired. While the mill is declining further business for 1901 it has been accepting business for 1902, and registered an order for 25,000 tons of Sheet Plates for that delivery. The officials are extremely reticent as to what the mill is doing, and the above item "leaked" to your correspondent from an outsider posted as to the inside.

There is no change in either the Coal or Coke situation. To get cars to haul it is the same unsolved problem confronting the operators. Those who have contracted for certain delivery of either are having "a de'il of a time" to meet obligations, on account of car supply; and those who anticipated regular deliveries are now reading appropriate chapters in the Book of Job.

The Belgian Iron Market.

BRUSSELS, November 15, 1901.

Business in general has not improved since our last report; it is on the contrary quite poor, as far as prices are concerned, owing to competition from Germany, which continues to exercise its depressing influence, not only on the international market, but even on our Belgian home market.

Instead of seeking orders at ruinously low prices metallurgists contract production as much as possible in hopes of better times. If in our last correspondence we have been able to report the starting up of some blast furnaces, we, unfortunately, cannot say that the good movement has continued. On the contrary, if the coke syndicate do not soon decide to place their prices on a level more in bearing with the situation, we may look for more furnaces shutting down.

Foreign countries, especially Luxemburg and the eastern part of France, offer to our rolling mills Pig Iron at very low prices which still more depress the quotations of our home producers. Refined French has even sold as low as 50 francs per ton, delivered at Charlerol. To render an idea of the increasing purchases from abroad of our rolling mills, suffice it to state that during the month of October 20,630 tons of Pig Iron have been imported into Belgium, against 8845 tons in 1900, being an increase of 11,785 tons, or 132 per cent.

Following is a table of our importation of Pig Iron and Scrap Iron during the first ten months of the years 1900 and 1901:

Imports.

	Ten months, 1901. Tons.	Ten months, 1900. Tons.
Pig Iron	37,895	272,441
Castings	7,149	3,573
Scraps	36,212	56,210
Totals	181,256	332,224

As to our importation, it sums up as follows:

Exports.

	Ten months, 1901. Tons.	Ten months, 1900. Tons.
Pig Iron	11,995	6,836
Castings	20,261	22,136
Scraps	23,790	37,007
Totals	56,046	65,979

This state of affiairs proves that there has been a decrease in importation of 150,968 tons, or 45 per cent., while the export movement has increased 9933 tons, or 17 per cent.

Prices quoted at the present time for the grades of Iron generally used are: Foundry Pig, No. 3, Luxemburg, 56 francs; Puddling Iron, Luxemburg, 48 francs;

Puddling Iron, Charleroi, 51.50 francs, and Thomas Pig 65 francs per ton. There is no change in the list of blast furnaces in existence and in operation up to November 15. In the Charleroi district out of 18 furnaces eight are extinct or banked. In the Liége country out of 17 furnaces 12 are active and five idle. In the province of Luxemburg again there is but one blast furnace out of work, the remaining five being kept active continuously.

In intermediate material, such as Steel Ingots, Blooms and Billets, foreign competition has a free field. In fact during the first ten months of 1901 we have imported 64,055 tons, against only 12,744 tons in 1900, showing an increase of 51,311 tons for 1901, or 40 per cent.

Our export movement is insignificant, with only 600 tons in the first ten months of 1901, against 1700 tons in 1900.

For Ingots buyers are numerous for home trade as well as for export. Prices range from 90 francs to 91.50 francs per ton, delivered at consuming mills.

Blooms and Billets are selling at 93 and 100 francs respectively, but for large quantities concessions are made.

Regarding Finished Iron and Steel sales are restricted to but small lots and business in larger quantities is very rare. Certain mills even, being short of orders, were obliged to lower their selling prices to secure contracts in order to bridge over the winter season without stoppage.

In Iron Bars the tendency is less encouraging than it was a month ago, as offers are coming in less plentifully.

In spite of low prices the demand for Merchant Steels is insignificant; it may be said that it is literally impossible for producers to secure orders.

India and Japan are looking forward to further reductions.

In Beams the struggle in the market for export is as lively as ever. The enormous stocks of German Beams are thrown on our market at famine prices, simply a matter of getting cash.

The market for Bolts is unsettled, and the prospects for the winter season are rather poor. The same may be said of the Wire market. Wire Nail interests are also suffering from the present crisis and complaints are heard from all sides of the reduced prices at which sales have to be closed; there remain, however, sufficient back orders to be filled.

The propositions which our manufacturers have received from the American Steel & Wire Company have been carefully examined. As yet no conclusion has been arrived at. There is no doubt, however, that a favorable decision could be obtained if producers could understand the great advantages which would result from such a combination for Belgium as well as for the United States.

The prices of the principal products are as follows: For export: No. 2 Iron Bars, 125 francs; No. 3 Iron Bars, 130 francs; Beams, 105 francs; No. 2 Plates, 135 francs; No. 3 Plates, 140 francs; Steel Plates, 140 francs; Sheets, 145 francs; Rails, 115 francs. For home market: No. 2 Iron Bars, 132.50 francs; No. 3 Iron Bars, 137.50 francs; Beams, 125 francs; No. 2 Iron Plates, 140 francs; No. 3 Iron Plates, 145 francs; Basic Steel Plates, 145 francs; Sheets, 160 francs.

The following are our imports and exports of finished products during the ten first months of 1900 and 1901 respectively:

Exports.

	Ten months, 1901. Tons.	Ten months, 1900. Tons.
Wire	5,140	4,763
Beams	18,159	73,381
Rails	100,586	50,252
Plates and Sheets	54,830	63,881
Rolled	165,363	156,074
Nails	11,925	10,165
Forgings	55,596	63,593
Galvanized and Tin Plate	3,006	3,079
Totals	414,605	425,188

The falling off in 1901, as compared to 1900, amounts to 10,583 tons, or 2.4 per cent.

Concerning our imports they have increased 7978 tons, or 10.9 per cent., as will be seen from the following table:

Imports.

	Ten months, 1901. Tons.	Ten months, 1900. Tons.
Wire	27,590	19,257
Beams	9,265	1,855
Rails	926	940
Plates and Sheets	9,023	12,905
Rolled	18,316	26,417
Nails	635	582
Forgings	11,632	7,046
Galvanized and Tin Plate	3,631	4,038
Totals	81,018	73,040

During the present month the State has placed contracts for the following rolling stock—viz., 180 tenders, with all accessories, amounting to about 1,800,000 francs. This will keep the construction shops busy for some time to come at least.

Whatever may be the grievances of English constructors against American locomotives it is evident that the latter can be furnished in considerably less time and work better.

One of the financial newspapers of Belgium, *Le Courrier de la Bourse et de la Banque*, announced some time ago that the managers of the Bavarian State railroads had purchased two locomotives of the Vauclain system of the Baldwin Locomotive Works of Philadelphia, Pa., and, according to said paper, it appears that the locomotives fully satisfied the expectations of the managers. They even bought the Vauclain patent, in order to be able to construct similar locomotives in their shops at Munich.

Certainly the administration of Belgian railways would lose nothing in making a similar trial, but here we have to contend with a spirit of protectionism, which is beginning to take root.

Pittsburgh.

HAMILTON BUILDING, December 4, 1901.—(*By Telegraph.*)

Pig Iron.—There is not much Iron being sold, for the reason that the furnaces are sold up and have no prompt Iron to spare and also because they cannot get cars enough to ship out Iron they have sold. The car situation among the furnaces, while possibly a little better, is still the cause of a good deal of complaint and thousands of tons of Iron are piled up in the furnace yards awaiting shipment. The price of Standard Bessemer Iron from the association furnaces is $15.25 at furnace, but small lots of prompt Iron have sold as high as $15.75 and even $16 is said to have been done. The United States Steel Corporation will probably buy some January Iron early this month. Forge Iron is very scarce, and none of the Valley furnaces are quoting, being sold up. Eastern Forge can be brought into this market at about $14.75, delivered. Foundry Iron is very firm, and some of the furnaces report their product practically sold up for first six months. We quote Standard Bessemer Pig Iron at the association price of $15.25 at Valley furnaces. Small lots of Bessemer for spot shipment are quoted at $15.50 to $15.75 at furnace. Gray Forge is $14.75, Pittsburgh, with reports that $15 has been done. No. 1 Foundry Iron is $16 to $16.50, and No. 2 is $15.50 to $15.75, Pittsburgh.

Billets.—Small lots of prompt Steel are held at about $28, Pittsburgh. Nothing is doing in large lots for next year, as consumers refuse to buy ahead at present high prices. Sheet Bars are quoted at $29 to $30 for spot shipment, but on contracts which are based on $1 a ton advance over the price of Billets Sheet Bars are selling below $28, Pittsburgh.

Muck Bar.—The market does not seem to be quite as firm as it was and there is only a fair inquiry. We quote standard grades of Muck Bar at $29.25 to $29.50, Pittsburgh. We note sales of about 2000 tons at $29.25.

Connellsville Coke.—The Coke market is very active and prices are higher. Contracts for strictly Connellsville Furnace Coke have been made for first six months of next year at prices ranging from $2.15 to $2.25, net ton, at oven. Seventy-two hour Foundry Coke is firm at $2.50 a ton. Main line Furnace Coke is $1.85 to $2, and Foundry, $2 to $2.25, depending on the contract. The output of Coke last week was over 235,000 tons. Some ovens in the Connellsville region that have been idle for some time are being repaired and will soon be fired up.

(By Mail.)

The principal item of interest to note in the Iron trade this week is that the car situation is reported to be somewhat better. Reports from the Mahoning and Shenango valleys show that to-day (Tuesday) not a single furnace is idle for want of Coke, and the outlook is that the worst of the trouble is over. Along the Allegheny Valley Railway in this city, on which are located a large number of manufacturing plants, there has been more or less trouble for a week on account of the switchmen's strike, and at this writing a number of the plants are totally idle and others are running only partly full. Zug & Co. and the Shoenberger Works of the American Steel & Wire Company have been idle for several days, while the Upper and Lower Union mills of the Carnegie Steel Company have been more or less crippled for a week. However, the railroads are making a strenuous effort to relieve the situation, and with some success. It is expected the supply of cars will be better right along, and that by the first of the year it will be large enough to pretty well take care of the enormous tonnage. The scarcity of cars for shipment of Pig Iron and of Coke for making it have led to some fancy prices being paid on small lots of metal for prompt shipment. Standard Bessemer Iron for prompt delivery has sold in small lots from $15.50 to $15.75, but the association price remains at $15.25, at furnace, for Standard Bessemer and $15 for Basic. The United States Steel Corporation have not bought any for January delivery as yet, but will likely do so before this week is out. There is still a wide range in prices of Steel for prompt delivery. Billets are selling all the way from $27 to $28, or higher. On the other hand, several Steel concerns selling Sheet Bars and other Material, based on the price of Billets, have fixed the price of Billets at $25, maker's mill. Where a mill has some Steel to spare and an old customer wants some, it is probable that not above $25 is charged. The situation in Finished Material does not present much that is new. This is usually the dullest month in the year in the Iron trade, and this month is not likely to show an exception to this. There is a fair amount of buying, but not as large as some time ago. The finishing mills are well filled up with work for the next two or three months, and the outlook for next year is very bright, indeed. The only exceptions to this condition are Plates, which are dull in demand; and also Nails and Wire, which are not only dull in demand, but weak in price. It is understood that Wire Nails have sold very close to $2 a keg, at maker's mill. There are more Wire Nails being offered just now than the trade can take. It is understood that some Coke contracts have been made for next year on the basis of $2 a ton for Standard Connellsville Furnace.

Muck Bar.—The market is somewhat quiet, and we quote Standard grades of Muck Bar at $29.25 to $29.50 f.o.b. Pittsburgh. A sale of about 1000 tons is reported on the basis of $29.50, Pittsburgh.

Steel Rails.—Some of the roads that have not yet covered their requirements of Rails for next year are expected to come into the market before this month is out and place their orders. The Rail mills owned by the constituent companies of the United States Steel Corporation are understood to be sold up into the third quarter of next year. There is no change in prices, nor is there likely to be, and we quote Rails at $28, at mill, for Standard Sections.

Ferromanganese.—We continue to quote foreign Ferro in carloads and larger lots at $50, Pittsburgh, and domestic at $52.50, delivered.

Spelter.—There is a good deal of inquiry for delivery in first quarter of next year, and we quote prime Western grades at 4.15c. to 4.20c., Pittsburgh.

Rods.—There is not much inquiry and the market is dull at $33, Pittsburgh. On a large order and desirable specifications this price would be shaded.

Structural Material.—Two large local jobs are being figured on and will likely be placed before long. One is the proposed Oliver office building, to be erected on Smithfield street, in this city, which will require 5000 tons or more. The other is a bridge at Bellvernon, which will require 5000 to 6000 tons. A good many small orders are being placed and the mills will have all they can do through the winter months. There will be no advance in prices, as several of the leading mills in the Beam pool are opposed to it. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inches, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh.

Plates.—Tonnage does not show much improvement, but a good deal of work is in sight and will likely be placed shortly after the first of the year, if not before. Reports that prices of Plates are being shaded are denied by the mills. We quote: Tank Plate, ¼ inch thick, up to 100 inches in width, 1.60c. at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.80c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3-16 inch in thickness; $1 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days.

Iron and Steel Bars.—Only a moderate amount of tonnage is being placed, and the mills have pretty well caught up with back orders. Some heavy contracts from the car builders for delivery through next year are being figured on and will likely be placed in a short time. Reports are that in exceptional cases fixed prices on Iron Bars are being shaded, but this is denied by the mills, who state that there is no cutting whatever. There is very little trouble now in getting prompt delivery of either Iron or Steel Bars. We quote Steel Bars at 1.50c. at mill, half extras, with $2 a ton advance for open hearth stock and the usual advances for Special Shapes. We quote Iron Bars at 1.55c., Pittsburgh, for Eastern shipment, and 1.50c. for Western shipment.

Sheets.—Prices on Sheets are not any too firm, as three or four of the new independent mills are about ready to start and are soliciting orders vigorously. In some cases favorable prices are being made to buyers to secure tonnage. We quote Black Sheets, Box Annealed, one pass through cold rolls, as follows: Nos. 10, 11 and 12, 2.40c.; Nos. 14 and 15, 2.50c.; Nos. 16 and 17, 2.60c.; Nos. 18 to 21 inclusive, 2.70c.; Nos. 22, 23 and 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c.; No. 28, 3.10c.; No. 29, 3.25c.; No. 30, 3.35c. For good orders, Sheets can be bought on the basis of 2.80c. for No. 26, 2.90c. for No. 27 and 3c. for No. 28. Small lots of Sheets bring about 3.10c. for No. 27 and 3.15c. for No. 28. We quote Galvanized Sheets at 70 and 5 off in carloads, and 70 off in small lots, maker's mill.

Merchant Steel.—Demand is mostly for small lots, but the mills are pretty well filled up for the next two or three months. Buyers do not anticipate that prices will be higher, and are placing orders for immediate wants only. There is no change in prices and we quote: Tire Steel, best quality, 1.70c.; Toe Calk, 1.80c. to 1.85c.; Hammered Lay Steel, 3.50c.; Open Hearth Spring, 2.50c. to 2.75c.; Steel Bars, 1.50c., base, in carloads, and 1.60c. in small lots; ordinary Plow Slabs up to 6 inches wide, 2.25c.; over 6 inches wide, 2.40c. For ordinary orders we quote Cold Rolled and Cold Drawn Shafting at 60 per cent. off in carloads and 55 per cent. off in less than carloads, delivered at all points east of the Mississippi River. We quote Tool Steel at 6c. and upward, depending on quality.

Boiler Tubes.—Demand continues heavy and the mills are filled up for several months ahead. Prices are firm and to consumers are as follows:

Boiler Tubes.	Up to 22 feet. Per cent.
Steel.	
1 inch to 1¾ inch and 2¾ inch to 5 inch, inclusive	65½
2 inch to 2½ inch, inclusive	60
6 inch and larger	59
Iron.	
1 inch to 1½ inch and 2½ inch	43½
1¾ to 2¼ inch	43
2¾ to 13 inch	53

Mills name the jobbing trade slightly lower prices than the above.

Skelp.—A sale of 200 tons of Grooved Iron Skelp is reported at 1.80c., maker's mill. There is not much inquiry, but several of the large users of Skelp are expected to be in the market before long. We quote Grooved and Sheared Steel Skelp at 1.70c. to 1.75c., Grooved Iron Skelp, 1.80c., and Sheared, 1.85c., f.o.b. maker's mill, less 2 per cent. off for cash in 30 days from date of shipment. We note a sale of 250 tons of Grooved Iron Skelp at 1.80c., maker's mill.

Merchant Pipe.—Tonnage in Merchant Pipe and oil country goods has fallen off a good deal, as it always does at this season of the year. Some of the outside mills are going after orders for Tubing very aggressively and are naming low prices. To consumers in carload lots prices are as follows:

Merchant Pipe.

	Per cent. Black.	Per cent. Galvd.
⅛ to ½ inch and 11 to 12 inch	61	48
⅝ to 10 inch	68½	56

Casing, Random Lengths.

	S. & S.	I. J.
2 to 3 inch	58	53½
3½ to 4 inch	63	59
4½ to 12½ inch	65	61½

Casing, Cut Lengths.

	S. & S.	I. J.
2 to 3 inch	53½	59
3½ to 4 inch	59	55
4½ to 12½ inch	61½	57½

Prices to jobbers are from 5 to 7½ per cent. lower than the above.

Iron and Steel Scrap.—There is an active demand for Scrap, and while prices are not any higher, they are firm. We quote Heavy Melting Stock at $18 to $18.50 gross ton; No. 1 Wrought Scrap, $16.50 to $17 net ton; Old Iron Rails, $22 to $23 gross ton, and Piling Scrap, $18 gross ton.

New York.

NEW YORK, December 4, 1901.

Pig Iron.—The majority of the furnaces tributary to this district are sold up for from four to six months, and yet the demand is not fully satisfied. There is some disposition among sellers to protect themselves by asking an advance upon present prices on deliveries during the next few months. Among the recent sales we note one lot of 3000 tons to a stove founder, the sellers being Eastern Pennsylvania and Virginia furnaces. We quote: No. 1, $16.35 to $17.50; No. 2 X, $15.65 to $16; No. 2 Plain, $15.15 to $16; Gray Forge, $14.65; Tennessee and Alabama brands, No. 1 Foundry, $16; No. 2 Foundry, $15.25; No. 1 Soft, $16; No. 2 Soft, $15.25; No. 3 Foundry, $14.75; No. 4 Foundry, $14.25; Gray Forge, $14.25.

Cast Iron Pipe.—No large transactions are reported. The extraordinary condition of this year's demand is shown by the fact that the shops have not yet been able to begin making Pipe for stock, which they usually begin to do long before this. We continue to quote $26 to $27 per gross ton at tidewater.

Steel Rails.—Reports show that the total sales of Standard Rails to date for next year's delivery aggregate 1,368,000 tons. This does not include Rails for electric lines. It is reported that foreign Rails can be laid down, c.i.f. New York, at £5. Adding the duty of $8.96, this would bring the cost roughly to $34, so that importations are not possible except under special circumstances at Pacific Coast points. The price quoted, however, shows what low figures our Rail mills would have to meet if they were to hunt for foreign business. We continue to quote Standard Sections at $28, Eastern mill.

Finished Iron and Steel.—No large transactions are reported locally in Structural Steel. The awarding of the contract for the building of the Custom House will bring quite some tonnage into the market. Prices are quoted as follows at tidewater: Beams, Channels and Zees, 1.75c. to 1.80c; Angles, 1.75c. to 1.80c.; Tees, 1.80c. to 1.85c.; Bulb Angles and Deck Beams, 2c.; Sheared Steel Plates are 1.80c. to 1.85c. for Tank, 1.90c. to 1.95c. for Flange, 2c. to 2.05c. for Fire Box. Charcoal Iron Plates are held at 2.40c. for C. H. No. 1, 2.90c. for Flange, and 3.40c. for Fire Box. Refined Bars are 1.65c.; Soft Steel Bars, 1.70c.

The Lehigh Steel & Iron Company of Allentown, Pa., who have started their furnace after a long idleness, announce that they have opened an office for the sale of Pig Iron in the Beard Building, 120-122 Liberty street. R. S. Bosworth will be in charge of the sales department.

Metal Market.

NEW YORK, December 4, 1901.

Pig Tin.—The corner in spot and November Tin, which last week shot prices up to 33c., is over, and prices are settling back to the vicinity of normal values. Just before the close of last month the delayed steamers all arrived safely, and being promptly discharged, relieved the situation. Immediately spot fell rapidly, and on Saturday last ex-stock was offered at 26c., but could not find buyers. Since then the market has continued to decline, closing to-day at 24.50c. to 24.75c. Futures were quoted as follows: December, 24.65c. to 24.75c.; January, 23.75c. to 24c. London was quoted very weak, at £110 15s. for spot and £104 for futures. The monthly statistics are viewed as being very unfavorable. The increase in the visible supply amounts to more than 2700 tons, being the largest for the year.

Copper.—The crisis is evidently close at hand, and the market stands entirely demoralized to-day. The large interest which has upheld the price right along is quoted in the trade as giving up the fight in this respect and declaring open market. All quotations are entirely nominal, and only the most urgent purchases are being made. The figures generally given in the trade are 16½c. to 17c. for spot, 16⅝c. to 16⅝c. for Electrolytic and 16c. for Casting. The market is, however, so unsettled that it is impossible to get any idea of values. Rumors of large sales at cut prices, or at present prices with a guarantee against decline, are discredited in the trade. It is held that under conditions such as exist to-day consumers would not enter the market under any circumstances. The course of the London market is taken to reflect the actual situation in Copper. Very large sales have been made there lately, and at prices equivalent to 12c. It is claimed that the Copper could be brought here, refined and laid down here at a price not exceeding 13½c. London has had a series of sharp breaks, toppling from £65 for spot and £62 10s. for futures last week to £55 5s. for spot and £55 for futures. Heavy sales were again reported to-day from London. Best Selected declined £2 to £70, which is equivalent to 14.72c., London. The exports for the month of November amounted to 6367 tons.

Pig Lead—Is entirely unchanged. The American Smelting & Refining Company still quote 4.37½c. for Desilverized, f.o.b. New York, and 4.32½c., St. Louis. London declined 3 shillings 9 pence to £11.

Spelter.—Business is quiet at 4.30c. here and 4.10c. to 4.15c., St. Louis. London declined 6 pence to £16 10s.

Antimony—is unchanged. Hallett's is quoted 8⅜c. Cookson's is unchanged, being held nominally at 10¼c. Outside brands declined to 8c. to 8¼c.

Nickel—Is unchanged, prices continuing on a basis of 60c. for lots not covered by yearly contracts.

Quicksilver.—There is no change here. The price is $51 per flask of 76½ lbs., in lots of 50 flasks and more. London has declined 2 shillings 6 pence, to £8 17s. 6d.

Tin Plates.—The situation is unchanged. The American Tin Plate Company are selling only for the first quarter of next year on a basis of $4.19 per box of standard 100-lb. Cokes, f.o.b. New York, and $4 f.o.b. mills. There was a decline of 5½ shillings in London, the price falling to 12 shillings 10½ pence.

The South Carolina and West Indian Exposition was formally opened at Charleston, S. C., on Monday. Senator Depew was the orator of the occasion, and a message of greeting was sent by President Roosevelt.

Mechanical Engineers.

New York Convention.

The first session of the American Society of Mechanical Engineers was held at the house of the society last Tuesday evening. The retiring president, Samuel T. Wellman, then read his address on "The Early History of Open Hearth Steel Manufacture in the United States," which will be found presented in part elsewhere in this issue.

Among those present were the following:

Wellman, Samuel T., president, Cleveland, Ohio.
Wiley, Wm. H., treasurer, New York.
Hutton, F. R., secretary, New York.
Reynolds, Edwin, nominated for president, 1901-2, Cleveland, Ohio.
Loring, Charles H., Brooklyn, N. Y.
Hunt, Charles Wallace, New York.
Wales, Chas. M., New York.
Parsons, W. de B., New York.
Nason, Carleton W., New York.
Monaghan, Wm. F., New York.
Giles, C. E., Providence, R. I.
Warner, W. R., Cleveland, Ohio.
Cox, J. D., Cleveland, Ohio.
Richards, F. H., Hartford, Conn.
Benjamin, C. H., Cleveland, Ohio.
Rites, F. M., Ithaca, N. Y.
Swasey, Ambrose, Cleveland, Ohio.
Foster, Chas. F., Chicago, Ill.
Gale, Horace, B., Natick, Mass.
McFarland, W. M., Pittsburgh, Pa.
Wood, E. E., Springfield, Vt.
Bauer, Chas. L., Springfield, Ohio.
Bruegel, Theo. A., Philadelphia.
Billings, Chas. E., Hartford, Conn.
Honsberg, Aug. A., Cleveland, Ohio.
Norris, H. M., Cincinnati, Ohio.
Paul, J. W., Kittanning, Pa.
Fisher, Clark, Trenton, N. J.
Ridsdale, T. W., New York.
Stillman, F. H., New York.
Gillis, A. R., Syracuse, N. Y.
Fernald, R. H., New York.
Scott, Geo. H., Worcester, Mass.
Ashworth, Daniel, Pittsburgh, Pa.
Winther, Chas. A. G., Indian Orchard, Mass.
Boyer, E. S., New York.
Morgan, Chas. H., Worcester, Mass.
Archer, E. R., Richmond.
Kafer, John C., New York.
Manning, Chas. H., Manchester, N. H.
Tabor, Harris, Elizabeth, N. J.
Schoenborn, W. E., Washington, D. C.
Boyer, C. W., Somerville, Mass.
Townsend, David, Philadelphia, Pa.
Raynal, A. H., Washington, D. C.
Barrus, Geo. H., Boston, Mass.
Rogers, W. S., Keene, N. H.
Hill, John W., Keene, N. H.
Boyer, Francis H., Somerville, Mass.
Ashton, A. C., Boston, Mass.
Garrett, Wm., Cleveland, Ohio.
Naylor, Ernest W., Philadelphia, Pa.
Allen, Chas. M., Worcester, Mass.
Armstrong, E. J., Erie, Pa.
Tyler, Chas. C., Pittsburgh, Pa.
Woodbury, C. J. H., Lynn, Mass.
Olcott, E. E., New York.
Basford, G. M., New York.
Green, Samuel M., Holyoke, Mass.
Sweet, John E., Syracuse, N. Y.
Burgdorff, T. F., New York.
Baldwin, Wm. J., New York.
Fleischman, Otto, Boston, Mass.
Wheeler, F. Meriam, New York.
Wilson, J. Fred., Worcester, Mass.
Fladd, Fred'k C., Brooklyn.
Alexander, L. A., Ansonia, Conn.
Bates, E. P., Syracuse, N. Y.
Almond, T. R., Brooklyn.
Rockwood, Geo. L., Worcester, Mass.
McBride, James, Brooklyn.
Parks, E. H., Providence, R. I.
Whitehead, Geo. E., Providence, R. I.
Silk, E. E., Guest of Council.
Cullingworth, G. R., New York.
Peck, Geo. M., New York.
Christie, W. Wallace, Paterson, N. J.
Hoppes, John J., Springfield, Ohio.
Hoppes, Chas. E., Springfield, Ohio.
Pitkin, A. J., Schenectady, N. Y.
Rielly, Wm. J., Cleveland, Ohio.
Webster, W. R., Philadelphia, Pa.
White, Maunsel, Bethlehem, Pa.
Alberger, Louis R., New York.
Pusey, Chas. W., Wilmington, Del.
Walworth, Arthur C., Boston, Mass.

Wednesday morning was the usual business session. The following officers were elected for the ensuing year: President, Edwin Reynolds of Milwaukee; vice-presidents, Wilfred Lewis of Philadelphia, M. E. Cooley of Ann Arbor, Mich., and M. P. Higgins of Worcester, Mass. For managers: R. S. Moore of San Francisco, H. A. Gillis of Richmond, Va., and Charles H. Corbett of Brooklyn, and for treasurer, William H. Wiley of New York.

The report of the Council showed that last December a committee of three was ordered to consider the advisability of extending the usefulness of the secretary's office. As a result of the work of this committee the Council approved a policy looking to a more active canvass for desirable papers to be read at the meetings, and further that certain directions of work should be pursued with more vigor. It was ordered that an additional assistant should be furnished to the secretary, and who should be an educated mechanical engineer. The position thus created is being filled by Arthur L. Rice.

The present membership of the society in its various grades is as follows: Honorary members, 18; members, 1615; associates, 159, and juniors, 537, making a total of 2329. There are in addition 96 life members.

Dues Not Increased.

At the Milwaukee meeting notice was given of a proposed amendment to the rules that the initiation fees and annual dues of a member and associate shall be increased from $15 to $25, and of a junior from $10 to $15. Notices were sent to the members by the Council (which includes all the past presidents, the president, vice-presidents and managers), stating that such increase was necessary in order that the society might pay outstanding indebtedness and increase its facilities for doing work, with a suggestion that the added income might permit of research along certain lines. The circular stated that the present return to members in the form of publications and otherwise costs a sum per annum greater than the aggregate sum received in dues. And therefore to maintain the present return at the present rates of dues would be to run the society in debt. After this statement is the remark "It is in debt now to its printer."

Discussion.

C. W. Hunt made a motion that the dues be increased as above stated, and explained that the life membership fee should be at least $350, since the present cost was too much at variance with the annual dues as they now stood. In other words, it paid a member unusual interest to join the life membership ranks. He explained that the society was now in debt over $13,000, which, of course, must be paid, and he was in favor of the increase, which would result in an additional income of about $20,000 annually, and would place the society on a sound financial footing. He further explained that the expenses of the society could be reduced by doing away with the pocket list of members, by the sending of papers in advance, and by reducing the number of papers printed at each meeting. He pledged the hearty co-operation of the council, no matter what might be the result of the vote.

Francis M. Boyer said that two-thirds of the members of the council did not know of the actual financial condition of the society until a meeting held October 31 last. The deficiency started three years ago. In order to maintain its position as a technical society and increase its usefulness to all its members, it is necessary to undertake original research. He referred to a paper to be presented at a later session on testing fly wheels to destruction, by Professor Benjamin, who had been limited in the size of the wheels he tried to 24 inches. Experiments along the same line could be undertaken in larger sizes of wheels if the funds were provided.

M. N. Forney thought it would be better to vote down the proposed amendment and inform all the members of the exact condition of the society's resources, when a more intelligent vote could be had at the next convention.

Angus Sinclair said that the council was at fault. "There is no use to say the council has done splendidly when it has allowed the society to run in debt."

Henry R. Towne said that the society was in no danger whatever of bankruptcy. Its credit was good for an indefinite period and its resources ample. He thought the best way out of the present trouble was to increase the dues, but not to the extent proposed. He advocated $20 for members and associates and $12.50 for juniors. This would increase the income about $9000, and would in a year and a half clear off the present debt.

Col. E. D. Meier said that resident members, since they received more benefits from residing near the headquarters, should pay more.

The result of the vote of members present, and of the proxies received and voted, resulted in the proposed amendment being lost.

The New York Machinery Market.

NEW YORK, December 4, 1901.

Interest in the general situation continues unabated. Demand in ordinary lines is keeping up with the quick pace set a short time ago. Special inquiries are said to be coming in with unusual frequency. Taken all in all, business is in an excellent condition in almost all branches of the trade. Industrial developments in the Southern States are calling forth special efforts on the part of sellers in that direction. Activity in these quarters is said to be very keen at present and a good line of future developments are under way. The great cotton mills of the South are making very extensive improvements, and fittingly the machine shops in the vicinity are having their capacity increased. The New port News ship yard is constantly growing, and crowded though it is with work, there is a large amount of prospective work in hand that will necessitate an increased purchase of equipment. Present indications point to the project looking toward the establishment of a new ship yard on the Gulf coast meeting with successful issue.

Things in the machinery trade generally go by extremes, and the matter of development of special territories is no exception to the rule. Consequently while one branch of the trade are making special efforts in the South, several prominent engineering firms are making a strong play for business in Canada. Here, also, industrial progress is making important strides. Another Northern project which is still attracting the attention of the trade is the Lackawanna Steel & Iron Company of Buffalo, N. Y. This concern have already purchased very heavily, but are not yet entirely out of the market. Such matters as machine shop equipment, hoists and accessories to the furnaces, &c., are as yet but partly settled.

Owing to the enormous amount of machinery required, the Havana sewerage job is obtaining closest attention. When the talk of revising the Dady bid became known it was erroneously reported that the contract had been awarded to Mr. Dady. The award has not been made as yet, and it was decided simply to recognize Mr. Dady's new bid. The matter is still in *statu quo*.

Machine Tools.

One of the most important developments was the deplorable announcement that owing to the great depression prevailing in Germany the firm of Gustav Diechmann & Sohn of Berlin had closed out in voluntary liquidation. We are officially advised of this fact, but the basis of settlement with the American creditors was not stated. It is stated in the trade that the amount involved is about $180,000. It is also stated that Mr. A. Otto Diechmann has offered to settle on a basis of 40 cents on the dollar. The concern were one of the best known of German importing machinery houses handling American machine tools. During the flourishing period of Germany's industrial prosperity the firm sold many American tools of some of the best builders. Even during the early portion of the depression abroad this concern were probably the heaviest purchasers of American machine tools. Among the concerns most seriously affected are said to be the Brown & Sharpe Mfg. Company of Providence, R. I.; the F. E. Reed Company of Worcester, and the Niles Tool Works Company of Hamilton, Ohio.

One of the most important of the operations now in prospect requiring a large amount of machinery is the rebuilding of one of the plants of the National Enameling & Stamping Company of 81-83 Fulton street, New York. The Brooklyn plant of this company, located on Metropolitan avenue, was totally destroyed by fire last week. The Executive Committee of the company now have the matter of rebuilding before them. It has not been decided whether the plant will be rebuilt on the old site or whether the plant at Berlin Village, L. I., is to be enlarged, and the two plants brought under one roof. In either event, a very large equipment of machinery will be required. The concern manufacture enameled kitchenware.

The American Match Machine Company, who are building new works at Avondale, N. J., are in the market for machinery. Another concern who were picking up equipment during the week were the Spiral Riveted Tube Company, who are erecting a new plant at Bergen Point, N. J.

The Dover Boiler Works of Dover, N. J., who are adding extensively to their plant, have been looking about for small traveling and jib cranes, and a number of machine tools. A portion of the new equipment has been purchased.

The McKiernan Drill Company, who recently removed their works from Paterson, N. J., to Dover, N. J., are now in the market for equipment for a new forge and blacksmith shop. The concern are manufacturers of mining machinery, rock drills, &c.

We are advised by the Lima Locomotive & Machine Company of Lima, Ohio, that they are about to commence the erection of a new machine shop, which will be 120 x 400 feet in size. The new shop will be the outcome of unusual prosperity, as the present works of the company are entirely inadequate.

The Lewis Foundry & Machine Company of Pittsburgh have placed an order with the Niles-Bement-Pond Company for a 60-ton double trolley electric traveling crane to be installed in their new works at Groveton, on the Pittsburgh & Lake Erie Railroad, near Pittsburgh. In the same plant are a 35-ton and a 15-ton electric traveling crane of the above type.

The New Century Heating & Ventilating Company of Cincinnati, Ohio, manufacturers of warm air furnaces, inform us that they are in the market for metal working machinery for making hot air furnaces, ranges and stoves. P. W. Beech is president of the company.

George Oldham & Son, Frankford, Philadelphia, Pa., pneumatic engineers and general machinists, are erecting an addition to their old mill. The Lodge & Shipley Machine Tool Company of Cincinnati, Ohio, have been awarded the contract for all the necessary equipment.

The Newhouse Wheel Company, 52 Broadway, New York City, have incorporated with a capital stock of $2,000,000 for the purpose of manufacturing mine and industrial car wheels, wagon hubs, trucks, &c. The company are in the market for a well equipped foundry adapted to making small car wheels with a capacity of from 50 to 100 tons per day. Location desired in Western Pennsylvania or Eastern Ohio, with good shipping facilities. C. W. Wheelock is the promoter of the company.

Cason, Richardson & Co., manufacturers of hardware, furniture, stoves, &c., advise us that they are going more extensively into the machinery business and shall be pleased to receive descriptive catalogues of slide valve engines, boilers, boiler pumps, &c. The concern are located at Nacogdoches, Texas.

We are informed that the Simpson Stove & Mfg. Company, who will remove their present works from Pittsburgh to Canonsburg, Pa., have drawn plans for a building, 200 x 100 feet, to contain a machine shop among equipment, warerooms and offices. Also a foundry building, 150 x 75 feet, and several small buildings. The plant will be equipped with modern appliances throughout, and is expected to be ready for operation in April or May of next year. The concern are in the market for foundry equipment and gas engines that will develop 100 horse-power. The concern are manufacturers of gas ranges and gas appliances.

Miscellaneous.

Builders of pumps are now figuring on that class of machinery that is to be installed in the battle ships now being built at the various large shipyards. The contracts for this portion of the ships' machinery are about to be awarded by the shipbuilders who have the craft under way. The yards engaged in this work are Cramps, Newport News, Union Iron Works and the Fore River Iron Works of Weymouth, Mass.

In connection with the two great ships that are now building at the plant of the Eastern Shipbuilding Company, at New London, Conn., the Lidgerwood Mfg. Company received a very large order. The order called for the ship's winches to be used on the vessel. There

are to be 76 of them, ranging from 5 to 20 tons. They will be electrically operated. General Electric motors will be used. These ships will be the largest cargo vessels ever built. They will have a carrying capacity of 21,000 tons, which is 1000 tons more than the "Celtic."

The Washington Company of 39 Cortlandt street, sales agents for the Franklin Boiler Works Company of Troy, N. Y., have received the order for the 600 horse-power water tube boilers to be installed in the new Pabst Theater of this city.

Hooven, Owens & Rentschler of 39-41 Cortlandt street were awarded a contract for two 900 horse-power cross compound condensing engines by the Cincinnati, Georgetown & Portsmouth Street Railway of Cincinnati. The engines are to be direct connected to electric generators. Cahall boilers have been ordered.

Naval Supplies.

PUGET SOUND.

Bids on machinery to be installed at the Puget Sound Navy Yard were opened on November 26, as follows:

Bidder 1. Mitchel, Lewis & Stover Company, Seattle, Wash.
2. Northwest Fixture Company, Seattle, Wash.
3. James O. Bradley, Tacoma, Wash.
4. Westinghouse Electric Company, Washington, D. C.
5. F. A. La Roche Company, 652 West Hudson street, New York City, informal.
6. Whyte & Smith, Washington, D. C.
7. Manning, Maxwell & Moore, 85 Liberty street, New York City.
8. Drew Machinery Agency, Manchester, N. H.
9. Dunham, Carrigan & Hayden Company, San Francisco, Cal.
10. Pacific Tool & Supply Company, 100 First street, San Francisco, Cal.
11. Pratt & Whitney Company, Hartford, Conn.
12. Fox Bros. & Co., 24 Vesey street, New York City.
13. Wagner Electric Mfg. Company, St. Louis, Mo.
14. Fairbank Company, 311 Broadway, New York City.
15. James G. Biddle, Stephen Girard Building, Philadelphia, Pa.
16. New Jersey Foundry & Machine Company, 26 Cortlandt street, New York City.
17. W. H. Foster, 126 Liberty street, New York City.
18. Montgomery & Co., 105 Fulton street, New York City.
19. Garvin Machine Company, Spring and Varick streets, New York City.
20. Manhattan Supply Company, 160 Duane street, New York City.
21. Niles Tool Works Company, Hamilton, Ohio.
22. Prentiss Tool & Supply Company, 115 Liberty street, New York City.
23. Western Electric Company, 57 Bethune street, New York City.
24. Charles C. Moore, 32 First street, San Francisco, Cal.
25. McCay Engineering Company, East German street, Baltimore, Md.
26. Henshaw, Bulkley & Co., Fremont street, San Francisco, Cal.
27. Park & Lacy, San Francisco, Cal.
28. James L. Robertson, 204 Fulton street, New York City.
29. Smith-Vail Company, Equitable Building, New York City.
30. Becker-Brainard Milling Machine Company, Hyde Park, Mass.
31. Putnam Machine Company, Fitchburg, Mass.
32. F. Harral, 85 Chambers street, New York City.
33. Long Arm System Company, Cleveland, Ohio.
34. Thresher Electric Company, Dayton, Ohio.
35. Tatum & Bowen, 34 Fremont street, San Francisco, Cal.
36. Mark Flather Planer Company, Nashua, N. H.
37. G. V. Crescent Company, Eighteenth street, Philadelphia, Pa.
38. Hanlon-Buck Mfg. Company, St. Louis, Mo.
39. Bentel & Margadent Company, Hamilton, Ohio.
40. M. F. Davidson, 42 Keap street, Brooklyn, N. Y.
41. Charles J. Tagliabue, 53 Fulton street, New York City, informal.
42. Wheeler Condenser Company, 120 Liberty street, New York City.

Class 1. One 100 horse-power boiler—Bidder 26, $2630; 24, $3900.

Class 2. One duplex feed pump for 100 horse-power boiler—Bidder 26, $65 and $70; 20, $77.90; 38, $80; 35, $86; 24, $85 and $65; 27, $90; 1, $94; 16, $98; 8, $104.25; 29, $111.75.

Class 3. One surface condenser for use with 100 horse-power boiler—Bidder 3, $887; 40, $1003; 42, $1040; 29, $1088; 24, $1134; 16, $1223.

Class 4. One 32-kw. generating set—Bidder 13, $3475; 3, $3700; 25, $4300; 34, $4650.

Class 5. One 15 horse-power motor, two 5 horse-power motors—Bidder 34, $650; 4, $725; 2, $815; 3, $870; 27, $903.75; 8, $991; 33, $1000; 16, $1069; 38, $1228.

Class 6. One 32-inch swing engine lathe—Bidder 3, $1093; 7, $1375 and $1525; 21, $1730; 31, $1885; 10, $1900.

Class 7. One 12-inch swing tool room lathe—Bidder 20, $77; 7, $315; 31, $365; 11, $405; 10, $470.

Class 8. One back geared turret lathe—Bidder 27, $1445; 3, $1465; 11, $2658.

Class 9. One 16-inch swing engine lathe—Bidder 26, $277, $293 and $275; 21, $308; 3, $332; 7, $350; 11, $395.80; 27, $406; 31, $435; 10, $503.50.

Class 10. One hand speed lathe—Bidder 10, $73; 17, $75; 12, $87.68; 7, $85 and $100; 22, $108; 21, $112; 27, $116; 31, $125; 11, $148.

Class 11. One universal milling machine—Bidder 31, $665; 3, $825; 21, $844; 26, $945 and $1070; 27, $1100; 30, $1113; 17, 1130; 38, $1144; 10, $1155; 22, $1267; 20, $1494; 7, $1675.

Class 12. One 24-inch pillar shaper—Bidder 21, $447; 22, $449; 26, $355 and $495; 27, $487; 10, $533; 3, $540; 17, $719; 36, $500, informal.

Class 13. One open side planing machine—Bidder 7, $1215; 14, $1295.

Class 14. One drill press—Bidder 21, $114; 26, $120; 27, $123; 7, $135; 10, $145; 3, $151; 17, $151; 22, $154; 31, $160.

Class 15. One sensitive three-spindle drill press—Bidder 21, $135; 3, $138; 11, $140; 17, $140; 7, $150; 27, $150; 22, $152; 10, $175.

Class 16. One universal grinding machine with attachments—Bidder 26, $370; 7, $490; 10, $595.

Class 17. One 24-inch water tool grinder—Bidder 26, $78; 22, $85; 3, $90; 7, $95 and $170; 17, $111.75; 27, $117; 21, $153; 10, $175; 38, $175.

Class 18. One polishing and buffing lathe—Bidder 17, $36.50; 2, $42; 10, $49.50; 26, $55; 27, $66.

Class 19. One grinding stone, trough and frame—Bidder 26, $67; 7, $70; 27, $82; 6, $126.88.

Class 20. One portable pipe threading machine—Bidder 3, $92; 17, $96; 14, $110; 7, $115; 8, $141.25; 10, $145; 27, $146.

Class 21. Twenty-four bench legs—Bidder 18, $84; 21, $93.60; 10, $96; 12, $99.84; 7, $100; 27, $122.40; 20, $143.21.

Class 22. One pattern makers' lathe—Bidder 3, $157; 27, $175; 22, $179; 21, $222 and $245; 7, $225; 26, $360, $297 and $320; 31, $435; 39, $566.

Class 23. One adjustable saw table—Bidder 3, $110; 21, $148; 26, $155; 35, $160; 27, $173; 38, $199.80; 39, $170, $224 and $210; 7, $215; 6, $235.

Class 24. One four-sided molder—Bidder 3, $225; 39, $248; 35, $265; 7, $275; 26, $295; 38, $309.70; 6, $378.10; 21, $228, $254 and $360.

Class 25. One 36-inch hand saw—Bidder 3, $130; 27, $140; 8, $149; 35, $150; 21, $162; 1, $170; 7, $125 and $175; 26, $125 and $152; 6, $210.50; 39, $166; 38, 220.30.

Class 26. One electro plating outfit—Bidder 2, $487; 25, $930.

Class 27. One ammeter, graduated to 750 amperes; one ammeter, graduated to 300 amperes; one ammeter, graduated to 15 amperes—Bidder 25, $160; 23, $163.10; 2, $172; 15, $191.50; 16, $192.

Class 28. One voltmeter, graduated from 0 to 15 volts; two voltmeters, graduated from 0 to 150 volts—Bidder 25, $125; 23, $162.35; 2, $171.75; 15, $190; 16, $191.

Class 29. One tachometer—Bidder 10, $54; 12, $59.85; 15, $60; 23, $60; 18, $65; 16, $76.18.

Class 30. One photometer—Bidder 15, $300.

Class 31. One testing set—Bidder 23, $60; 15, $70; 2, $78.50; 16, $89.35.

Class 32. One cast iron testing plate—No bids.

Class 33. One centrifugal steam separator—Bidder 8, $89.50; 16, $89.50; 12, $89.98; 24, $253.50.

Class 34. One steam gauge and one vacuum gauge—Bidder 20, $39; 9, $41.25; 10, $45; 12, $49.90; 1, $66; 16, $68.46; 27, $82.50.

Class 35. Two steam engine indicators—Bidder 28, $110; 10, $120; 8, $135; 38, $150; 16, $152.18; 12, $161.70; 20, $168; 27, $170; 7, $170; 9, $186.

Class 36. One steam calorimeter—Bidder 28, $33; 10, $50.

Class 37. Three thermometers—Bidder 12, $36; 20, $63.

Class 38. Instruments, tools, mechanics' clamps, lathe dogs, lathe tools, hand chasers, reamers, drills, files and miscellaneous hardware—Bidder 32, $899.48; 12, $867.84; 10, $978.51; 18, $990.56; 20, $1018.33; 27, informal.

Class 39. Eight pieces shafting 16 feet long, 6 pairs flanged couplings, 19 hangers—Bidder 20, $187; 37, $236.50; 27, $242.20; 8, $277; 18, $298.60; 1, $301.80.

Class 40. 64 feet wrought iron piping, 4 inches diameter—Bidder 1, $27.65.

MARE ISLAND BOILERS.

Bids were opened November 23 for furnishing and installing three 200 horse-power boilers at the navy yard, Mare Island, Cal., as follows:

Item 1. Price for plant of three boilers complete in accordance with plan and specification.
Item 2. Price for plant of two boilers complete in accordance with plan and specification.
Item 3. Time required.
The Risdon Iron & Locomotive Works, San Francisco, Cal., item 1, $26,825; 2, $22,305; 3, six months.
Charles C. Moore & Co., San Francisco, Cal., item 1, $30,788; 2, $26,677; 3, eight months.
Byron & Jackson, 411 Market street, San Francisco, item 1, $29,400; 2, $25,950.

It is reported that the October earnings of the United States Steel Corporation were $10,627,000, after setting aside $1,500,000 for improvements, &c.

A very handsome premium is being realized on the underwriting of the Pocahontas Coal Company, in which many men closely identified with the steel industry are interested. Thus far 75 per cent. has been called in and 10 per cent. may be requested at an early day. On Tuesday 129 was bid.

The Chicago and Northwestern Machinery Market.

CHICAGO, December 2, 1901.

The unanimity with which all machinery interests report continued activity is a gratifying feature of current trade. In every branch manufacturers are crowded with work, the pressure on their facilities increasing instead of diminishing. It is an exception to find an establishment not reporting an enlarged business in November as compared with previous months. The demand for machinery is doubly stimulated by the prosperous conditions now prevailing, as the manufacturers are being obliged to enlarge their equipment to meet the heavy demand from their customers. The conditions in some detail are shown in the following statements:

Engines and Mining Machinery.

Allis-Chalmers Company, Milwaukee, Wis., state that during the month of November they started a number of negotiations which they expect to close very shortly. About the usual number of minor orders have been received and they say they can see no diminution in the general demand. The new works of the company at West Allis are being erected with all possible speed.

Allis-Chalmers Company, Chicago, say that all the departments are enjoying good business, and their various works are running to their fullest capacity. As for the future outlook they say they anticipate continued prosperity in their respecive lines of manufacture.

Nordberg Mfg. Company, Milwaukee, Wis., state that inquiries seem to be on the increase, and orders are being placed at full prices to their fullest capacity. They could book more if they could promise any satisfactory delivery.

Charter Gas Engine Company, Sterling, Ill., report that their expectations of busines for November have been fully realized and anticipations for the future continue bright. They have made shipments during the month by the carload to different points in the country and their order book is crowded.

Marinette Iron Works, Marinette, Wis., state they found business during the month of November exceeding their expectations. They have received a large number of orders for engines from 50 to 125 horse-power for the Pittsburgh district, also orders for various city water and lighting plants and railway pumping contracts. They are placing orders on their books much more rapidly than they are able to fill them, although they have already increased the output of their plant by an addition of 125 feet to their machine shop, also installing a Taylor gas producer in connection with which they will run their plant with their own engines.

Machine Tools and Supplies.

Charles H. Besly & Co., Chicago, report their November business far in excess of October, which was one of the largest Octobers that they have ever experienced. They are receiving many orders from various sections of the West and Northwest for general supplies, as well as liberal orders for their Helmet oil, thus indicating the general prosperity of the manufacturing interests. They are very busy at their factory at Beloit, and are making additions of several thousand feet to their floor space in order to increase their output, and meet the demands of an increased business. They are shipping Gardner grinders, Bonanza cups and Badger die stocks to all parts of the world. During the last week they have made shipments of grinders to Ohio, Illinois, New York and Pennsylvania, while Badger and Gardner die stocks and Bonanza cups have been sent to England, Argentine Republic and Brazil. They anticipate an increased business for December and during the coming year. A new 50-page catalogue on specialties of their own manufacture has just been received from the printers and is ready for applicants.

Joseph T. Ryerson & Son, Chicago, say their machinery business for the month of November has been quite satisfactory, the demand from all sources being up to the standard reported for the last 60 or 90 days. Their general business in hydraulic and heavy power machinery for boiler shops and tank factories has been large. Among sales made are the following: Hydraulic riveter, to M. A. Ryan, Northwestern Steam Boiler Works, Duluth, Minn.; Lennox rotary bevel and slitting shears, to Aultman Company, Canton, Ohio; Dyer Brothers, San Francisco Cal.; Lake Shore & Michigan Southern Railroad, at Cleveland; Abendroth & Root Mfg. Company, Newburgh, N. Y., and others.

Hill Tool Company, Anderson, Ind., say that the past month has been the largest November they have ever had by from 25 to 30 per cent. All indications point to a bright future. The increase is not confined to any particular section, but is general at home and abroad.

Armstrong Bros.' Tool Company, Chicago, state that the volume of business in their specialties during November has been greater than they have experienced in any month in their experience. The best feature of this heavy demand is that it shows no signs of decreasing, but, on the contrary, it seems to become heavier each day. Of this increased business the West and Northwestern States have furnished their full share.

The Kempsmith Mfg. Company, Milwaukee, Wis., report that the volume of business for the month of November will very handsomely exceed that for any month since March 1900. They find the demand for millers very encouraging, and it is their opinion that the turn of the year will create further interest in the general line of machine tools. There is always a goodly amount of business entering the market after operations for the calendar year have been demonstrated profitable.

Hoefer Mfg. Company, Freeport, Ill., say their business for their regular line of metal saws, drill presses, furniture and bed spring machinery and wire straighteners is constantly on the increase, while their special machinery business has so enormously increased that they cannot possibly take care of it on account of the lack of room. This increase is not only in domestic, but also in foreign business, especially in the wire working machinery line. They have recently received a good order for fence machinery, and are figuring on large contracts now from several other parties for the same line of machinery, of which they are making a thorough study. They are also figuring wtih a European firm for a machine of this kind. They have recently developed a new barb wire machine on an entirely new principle. Their spring bed machinery is in great demand and they are constantly from two to three months behind on orders.

McDowell, Stocker & Co., Chicago, say their trade during November was very satisfactory, including several nice orders, among them the machine shop equipment for the E. P. Holden Machine Company, 176 South Clinton street, Chicago. They have plenty of new business to figure on and the outlook for the immediate future is very flattering.

Perry Ransom, Oshkosh, Wis., reports the past month an exceedingly busy one. They are looking forward to the largest winter trade they have ever had. With the exception of one good order from the Pittsburgh Steel Company, they have booked no specially interesting orders. Their trade seems to be scattering all over the country and extends from New York to San Francisco. They have also made shipments to Canada. The red tape which the custom house officials require, however, interferes with the quick delivery of goods in some cases.

John H. Dawson, successor to Dawson & Goodwin, Chicago, states that the month of November was remarkably active, the volume of business having been very much larger than in any previous month this year. He has purchased a large amount of machinery, both new and second hand, and has closed a contract with the W. P. Davis Machine Company of Rochester, N. Y., for their line of lathes, drill presses, key seat cutting machine and cutting off machines, also with the Philadelphia Machine Tool Company for their agency on punching presses, shears and multiple punches. Mr. Dawson has recently visited all the machinery markets from St. Louis to Philadelphia, and believes that Chicago carries a far greater stock of new and second hand machinery than any other point he visited.

Cranes.

Pawling & Harnischfeger, Milwaukee, Wis., manufacturers of electric traveling cranes, report their business entirely satisfactory. From the inquiries received and volume of busines secured, they can see no indcation of a change. Among orders recently booked are the following: Bethlehem Steel Company, South Bethlehem, Pa., one 25-ton; McDonough Mfg. Sompany, Eau Claire, Wis., one 6-ton; S. Freeman & Sons Mfg. Company, Racine, Wis., one 5-ton; Jackson Iron & Tin Plate Company, Clarksburg, W. Va., one 20-ton; R. J. Schwab & Sons Company, Milwaukee, Wis., one 10-ton; Commonwealth Electric Company, Chicago, Ill., two 8-ton and one 10-ton; Frank Darling, Vancouver, B. C., one 5-ton; J. I. Case Threshing Machine Company, Racine, Wis., one 10-ton; Sullivan Machinery Company, Chicago, Ill., one 15-ton; Midvale Steel Company, Philadelphia, Pa., one 150-ton, two 50-ton jibs, and one 10-ton jib; Wm. Bayley & Sons Company, Milwaukee, Wis., one 5-ton; Wisconsin Traction, Light, Heat & Power Company, Appleton, Wis., one 20-ton; American Steel Foundry Company, St. Louis, Mo., one 5-ton; Tacoma Smelting Company, Tacoma, Wash., one 20-ton; Sloss-Sheffield Steel & Iron Company, Birmingham, Ala., one 15-ton; Colonial Steel Company, South Monaca, Pa., two 3-ton; Pennsylvania Railroad Company, West Philadelphia, Pa., one 3-ton; McClintic-Marshall Construction Company, Rankin, Pa., one 20-ton; Allis-Chalmers Company, Milwaukee, Wis., four 10-ton, and Jeffrey Mfg. Company, Columbus, Ohio, one 25-ton and three 5-ton.

Industrial Works, Bay City, Mich., manufacturers of locomotive cranes, advise us that the aggregate of their November business compares well with previous months. September and October were two of the largest months they ever had. Everything from their point of view seems promising for the future.

Power Transmission Machinery.

Webster Mfg. Company, Chicago, say that business with them is very good. They have orders ahead for six months.

Stephens, Adamson & Co., Aurora, Ill., say their trade during the month of November showed a very noticeable increase in the volume of country business over the month of October, especially in the line of rope transmission outfits. Their factory is running ten hours per day, and they have work enough in their shops and in prospect to warrant their saying they will run full time all winter. They have just taken a contract for the equipment of a large beet sugar factory in the West, and have also taken contracts for several rope transmission and shafting outfits from manufacturers in Illinois and Ohio, who are extending their shops.

Northern Electrical Mfg. Company, Madison, Wis., report their November business exceeding that of any previous month of the year, and they have no reason to anticipate any abatement of interest in the use of electrical machinery. The industrial world seems to be rapidly awakening to the desirability of the electric drive for power transmission. The company are now building additions to their shops that will more than triple their capacity and they are in hopes that by January 1 they will be in much better shape for the prompt filling of orders.

The D. Clint Prescott Company, Menominee, Mich., say the month of November is usually one of their quietest months in the year. This year their November business has been double what it has been in any previous year, and they have orders enough ahead to keep them running night and day for six months.

Miscellaneous.

Union Steam Pump Company, Battle Creek, Mich., say that the present indications are that trade for the coming year will be even better than it has been. Order books are already overflowing with orders for future delivery, and they have enough to keep them busy for five months if they did not take another order.

The S. Freeman & Sons Mfg. Company, Racine, Wis., say their business was never better than at present. They have booked many good orders during the month of November, among which are six 250 horse-power internally fired boilers with corrugated furnaces for the Union Pacific Railroad Company, at Omaha, Neb., and five 72-inch by 16-foot horizontal tubular boilers for the Oregon Short Line Railroad Company, at Pocatello, Idaho. They are also in receipt of an order for a 225 horse-power internally fired boiler from the city of Lansing, Mich. At the present time they have orders for some 30 of this type of boilers, the demand for which seems to be growing rapidly, so much so, that they have recently ordered additional machinery for their boiler shop to the amount of $15,000, and have made some additions to the factory plant with a view of taking care of this business. A heavy trade seems assured at least for some months.

Novelty Iron Works, Dubuque, Iowa, say the condition of trade during the month of November was very good and the volume of sales for immediate delivery far exceeded expectations. Orders for their improved Boss belt hammers, to be delivered after the first of the year, are already pouring in from the jobbers, and it looks as though the lack of the usual fall business will be more than made up in the increased orders being booked for spring delivery. New fields are opening up for the power hammer, as is evidenced by correspondence with mining and lumbering firms, vehicle factories and other concerns now using heavy trip hammers or steam hammers, who are being attracted to the Boss hammer for light and rapid forging. Sales for shingle sawing machines are increasing, stock orders having been received from several machinery jobbers in the South, while shipments have recently been made direct to mills in Texas, Louisiana, Alabama and Florida.

Whiting Foundry Equipment Company, Harvey, Ill., state that their books are full of orders, and they see considerable business in the future.

The Stover Mfg. Company, Freeport, Ill., say the month of November was an exceptionally good one with them, as the demand for both wind mills and grinding mills has been very large. While they have made some progress in catching up with their orders they are still far behind, and there appears to be no let up in the demand upon them for these goods. As regards the coming season, the indications point to an active demand for their line of goods. Their new factory is nearing completion, and they hope to occupy it about the first of the year, which will give them very much increased facilities and enable them to more than double their output another year.

Chicago House Wrecking Company, Chicago, Ill., say that their statements of prosperity in the machinery line will possibly have become monotonous, but they find each month an increasing number of intending and actual purchasers. They are crowded with business, and especially so for boilers. During the last 30 days they have booked more orders for boilers than they have in the three months previous. Their shipments are being made all over the country. There is no exception to the condition of prosperity that seems to prevail, and it seems to be genuine and natural. There is not a spurt in the business, but a steady flow of orders and inquiries. They are shipping much material to the East, and have sold two boiler plants within the last few days within a radius of 100 miles of Boston. Have also sent considerable material into the Southeast. Three shipments were to South Carolina, one order into Georgia and one into Florida. As regards the future, they look for a business in 1902 that will eclipse all previous records.

Rapid work is being done on the new plant of the Riter-Conley Mfg. Company, which is being erected at Leetsdale, about 15 miles from Pittsburgh, on the line of the Pittsburgh, Ft. Wayne & Chicago Railway. The principle output of the new plant will be steel barges. The Riter-Conley Mfg. Company are also building handsome new offices on Water street, Pittsburgh, which will be ready for occupancy shortly after the first of the year. The new building is of fire brick, four stories high, 48 feet in width by 160 feet long. The building will be equipped with all the latest modern office appliances.

HARDWARE.

MINUTE ECONOMIES.

It has for years been the aim of manufacturers to avail themselves of the benefit of the most minute economies in the production of their goods. This has been forced upon them by the stress of competition, as in the long run success belongs to those who can turn out a given product at a minimum price. The application of this principle of economy in production is to a great extent the secret of the invention and enterprise which are so characteristic of this country, and which have so much to do with its manufacturing supremacy. The representative American manufacturer is constantly endeavoring to effect a saving somewhere. Not only machinery and inventions which effect important economies are sought for, but there is an unceasing effort to avoid unnecessary expense in any department of the business.

The same principle is applicable to mercantile business, in which the expense account is constantly to be reckoned with. Its tendency to grow and absorb the profits is one of the features of business. Enterprise, which is essential to success, usually involves outlay, which must notwithstanding be kept strictly within bounds. In connection with the repression of unprofitable expenditure there must be a close scrutiny of all the details of the business with a view to eliminating any outlay which does not justify itself, and also to diminish the expense in every department, so that the business may be carried on at as low a cost as possible. There is little doubt that this is a lesson which merchants need to learn. In this respect the manufacturers are far in advance of them. The scrutiny of cost is much more rigid in the making than in the selling of goods. This is true in a good degree of many of the large houses, but the remark is still more applicable to the smaller houses. One of the good results of the associations which have been taking so prominent a place in the Hardware trade is the success with which they direct the attention of the members to the necessity there is for good business methods in this and many other matters. The tendency should be toward saving wherever it can be effected.

In view of the importance of economies in mercantile affairs the reform of dispensing with receipts for remittances, which is referred to in another column, is to be commended. The formal acknowledgment of the payment of an invoice or account is usually unnecessary, as the check or other form of payment is sufficient voucher. This being the case, the sending of a receipt is not only unnecessary but entails the expense of postage as well as the labor of making out the receipt at one end and of receiving and taking care of it at the other. It thus adds to the expense account without any corresponding gain. The practice of dispensing with the receipt has thus far worked satisfactorily with the enterprising houses who have adopted it, and unless further trial develops objections or opposition on the part of the trade at large its continued extension among progressive houses may be expected. We bespeak for it the approval of the trade, who should recognize not only the desirability of such economies, but should remember that their ultimate tendency is to diminish cost and thus redound to the general benefit.

The reform in question is one of the most minute of economies, but its adoption by some of the largest Hardware jobbing houses who are characterized by splendid business management is deserving of commendation not only for the saving effected, but also for the illustration it gives of the application of the principle of economy to what might seem to many an unimportant detail of business. It should impress on many a merchant, easy going and careless in his methods, the wisdom of close watchfulness of the expense account, even in the most insignificant matters. The example of the great houses doing a business which runs into millions, who are not above effecting economy in a small detail of their business system, should stimulate their customers, and manufacturers and merchants generally, to look into their own methods with a view to discovering savings that may be effected and improvements that may be inaugurated. Waste in mercantile as in manufacturing establishments is a mark of unbusinesslike management.

Condition of Trade.

There is a good volume of current business and the trade are evidently buying freely in most lines. Season goods are still commanding the attention of many of the larger merchants, and a great many orders have been taken. Prices for Hardware, both Shelf and Heavy, are as a rule steady. A few lines are regarded with especial caution as liable to yield something in price before long. A large proportion of the orders coming into manufacturers are for early shipment to meet immediate wants or to supply waiting customers. Winter goods are in especial demand, and on some lines are developing a decided scarcity. Merchants with the opening of the last month of the year are entering upon preparations for the holiday trade, which promises to be large, in view of the prevailing prosperity and the increasing observance of the holiday season. Merchants who have not completed their arrangements for the Christmas and New Year trade may find it necessary to make special efforts to get some lines of goods in time. Preparation for the closing of the year and plans for the next naturally begin to occupy the attention of manufacturers, but the pressure of current business is still heavy. Questions in regard to the outlook for the coming year—the continuance of the demand, the price of the raw material, the extent to which foreign trade will be developed—are being canvassed and optimistic views are generally entertained.

Chicago.

(By Telegraph.)

The November trade in Hardware proved to be surprisingly large. While somewhat below the aggregate for October the business for the month was considerably above that for November last year. December starts in well. There is the usual buying of holiday goods, but jobbers are not dwelling upon that feature of trade. What is the more interesting is that demand keeps up for the general line of Hardware, though the usual amount of holiday goods also will be sold. In some quarters the quiet of the approaching inventory season is perceptible. There are large shipments of Sheet products, the manufacture of which was delayed by the famine of three months ago. Quite an accumulation of orders of that nature had piled up, and with Sheet supplies since arriving at plants of consuming manufacturers the delayed shipments of finished products are under way. Open weather has contributed to some extent to the protracted demand for goods, but so widespread is the range of orders that everything kept in stock seems to be included in the current business. It is a feature of the Heavy Hardware trade that while large consumers have bought for their future needs the small users have pursued the opposite

course, and are taking goods only as they need them, often at the expense of serious delays.

St. Louis.

(By Telegraph.)

The volume of general business in the Hardware market is reported no lighter, and a heavy call for goods of a holiday character, such as Cutlery, Carving Sets, &c., is being felt. The buying for spring requirements continues good. Builders' Hardware is in marked demand, and a heavy volume of orders is being placed. A very fair and satisfactory condition of trade is reported in the heavy department of the market.

Boston.

BIGELOW & DOWSE COMPANY.—Business is good and every one is made hopeful by the bright outlook. Snow and ice have come early this year and remind one of old times, when Thanksgiving Day marked the beginning of winter. In this immediate vicinity there is only enough snow to whiten the hill tops, but there is good sleighing to the North and East. Most of the ponds throughout New England are frozen over and the skating is good. Contrasted with several years past the climatic conditions favor the consumption and distribution of all seasonable goods far in excess of that of many former years. The wholesale dealers are all very busy and the retail trade shows a marked improvement. There seems to be nothing in sight to mar the present outlook. Prices are being well maintained and remittances are fair to good.

Louisville.

W. B. BELKNAP & Co.—The reports that we get from Eastern papers fully reflect the condition of the market here. There is an extraordinary demand for heavy material, and considerable difficulty is experienced in getting supplies fast enough to keep stock in fairly good shape for filling assorted orders.

An advance in pig iron in the latter part of November is, we fancy, an unprecedented thing. If at any time in the year the market is apt to be dull it is in the month of November and early December.

Unless we are subjected to disaster or unpleasant surprises in some shape, it looks as though we were going to enjoy an extremely active spring season, and those of the trade who are accustomed to exercise forethought seem to be of the same impression, judging from the preparations they are making. It may be still more difficult to get goods in January and February.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—Letter from our house for *The Iron Age* of November 21 was conspicuous by its absence. The date of mailing found our four stories well soaked, the fire department finding it necessary to put nine streams of water on the top floor to cope with a fire that had a start such as is likely when the alarm is rung in at two o'clock in the morning. The fire damage was nothing in comparison with the water damage. However, we are in business still at the old stand and looking forward to a good trade after the holidays. Of course, with travelers in, working on inventory, made necessary by fire, we are not at this time doing our share in distributing Hardware.

During November our port has been shipping to Samoa, the Philippines, Siberia, China, Japan, South Africa, South America and Europe, showing a diversity of business that augurs well for the future.

The Pacific Northwest will enjoy a Thanksgiving in 1901 that will be memorable in its history, and one that is a forerunner of a development in this section undreamed of a few years ago.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—There is no perceptible change in the volume of trade since our last letter to *The Iron Age*, and wholesale houses are doing a business quite equal to any preceding years. The mild weather, however, does not stimulate the retail trade to call for midwinter goods. The mild, bright sunshiny days are not an incentive for persons to buy Snow Shovels, Skates or Oil Heaters and the variety of goods that follow in their wake. The retail trade, however, appear to be quite active with holiday goods and report good trade in the lines that are usually taken prior to the Christmas holidays. Some of the retail trade show a disposition to anticipate their wants for spring goods, The incentive for placing orders for Steel goods appears to be the present low prices. The disposition to place early orders on Poultry Netting and Wire Cloth is evidently because they are fearful of an advance after January 1, which, at the present writing, looks not unlikely. The firmness of the Iron and Steel market and the scarcity at the present time are not much of an incentive to manufacturers to reduce prices. We think the retail trade have caught onto that pretty well.

Collections are about up to the average in certain sections and below the average in other sections.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—We are glad to be able to report that the demand for goods continues strong, and business is quite satisfactory. The Hardware people are making great preparations for holiday trade and have every reason to expect a good business in this class of goods. In fact, there is at present a good demand for holiday goods of almost every description.

We have a good firm market on the entire line, with the exception of Wire Nails, which seem to be a little weak, and the price is being cut by the jobbers. Our information is, so far as the Hardware business is concerned in this section of the country, that sales and collections were never more satisfactory at this season of the year.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—November business has been very satisfactory. The demand for Hardware has continued strong throughout the entire month. As the holiday season approaches there has been a large trade in goods for the season. Collections have been unusually good.

New Orleans.

A. BALDWIN & Co.—As we approach the holidays business is slackening up somewhat, although it has been exceptionally active during the month of November.

Specifications for seasonable goods are much larger than usual, and altogether the situation is very encouraging.

NOTES ON PRICES.

Wire Nails.—The demand for Wire Nails continues fair, with orders largely confined to small lots. Lower prices are reported as being made by outside mills, which are treated with the consideration they deserve by the leading manufacturers. The influence of this competition is naturally in the direction of lower prices, but the market is steadied to a good degree by the strength in Rods and Billets, which justifies the maintenance of the price of Wire products at a point not very much below the present level. It is difficult to quote a price which represents the market as a whole, as quotations vary considerably, according to the special circumstance of the case. The line between jobbers and retailers is not marked at all strictly by many of the concerns which are about entering the field, and there is much irregularity in the prices made by jobbing houses to their customers. Altogether there is a good deal of unevenness in the market, not only to large but also to the smaller buyers, some of whom purchase from the manufacturers and others from the jobbers.

New York.—The continual demand for small lots of Wire Nails from store aggregates a considerable volume in the local market. The market is represented in a general way by the following prices: Small lots from store, $2.35 to $2.40; carloads on dock, $2.25.

Chicago, by Telegraph.—Weakness has appeared in

Wire Nails. A common quotation for small lots is $2.25, though some trade is still doing at $2.35. Trading is naturally restricted to the smallest quantities. A carload order is a rarity. From store consumption is heavy, and even in the face of the decline a large aggregate tonnage is moving. It is stated that there will probably be scarcely half the accumulation of Nails January 1 which should then be in stock for the spring trade, and that the promise is that the consumption next year will require the output of all the producing mills.

St. Louis, by Telegraph.—Irregularity in prices is the only feature in the Wire Nail market, and quotations all the way from $2.40 down to $2.30 and under are reported.

Pittsburgh.—The demand for Wire Nails is of a hand to mouth character, buyers continuing to buy only in small lots, and much of the business being placed is for less than carloads. The present condition of the Wire Nail market as regards prices is decidedly unsatisfactory to the makers, and it is not improbable an effort will be made at an early date to put the market on a better basis. Competition for business is very keen and low prices are being made. We quote Wire Nails in carloads at about $2.10, f.o.b. Pittsburgh. Small lots are held at $2.15 to $2.25, depending on the order.

Cut Nails.—The near approach of prices at which Wire Nails can be purchased to Cut Nail quotations is causing a falling off in the demand for the latter. The Cut Nail market is, however, firm at the following quotations, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots	$2.05
Less than carload lots	2.10

New York.—Cut Nails are in normal demand in the local market. Representatives of mills are adhering to the price of $2.25 for Nails from store. Jobbers are asking the same price generally, but in some cases are selling 2 cents below these figures. New York quotations for carload and less than carload lots are as follows:

Carload lots on dock	$2.18
Less than carload lots on dock	2.23
From store	2.25

Chicago, by Telegraph.—With Wire Nails selling below the price of Cut, which remains at $2.35, there is naturally a very small trade.

St. Louis, by Telegraph.—Prices and general conditions are unchanged in the market for Cut Nails. Small lots from store are quoted from $2.30 to $2.35.

Pittsburgh.—Former prices of Cut Nails have been reaffirmed for December delivery. Only a moderate amount of business is being placed and deliveries of small sizes of Cut Nails are difficult to obtain, owing to the fact that the mills cannot get Steel fast enough. Prices are firm, very little, if any, cutting being done. We quote for domestic trade, f.o.b. Pittsburgh, plus Tube freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots	$2.05
Less than carload lots	2.10

Barb Wire.—With the decreased activity of the Barb Wire market regular quotations are to some extent becoming nominal, concessions of from 5 to 10 cents being obtainable. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted	$2.60
To jobbers in carload lots, Galvanized	2.90
To jobbers in less than carload lots, Painted	2.65
To jobbers in less than carload lots, Galvanized	2.95
To retailers in carload lots, Painted	2.70
To retailers in carload lots, Galvanized	3.00
To retailers in less than carload lots, Painted	2.80
To retailers in less than carload lots, Galvanized	3.10

Chicago, by Telegraph.—Heavy orders have been booked for Barb Wire this week. The activity is in contrast with the decline in quotations. From store less than carloads are quoted $2.70 to $2.80 for Painted, and $3 to $3.10 for Galvanized. Carloads from store are no lower than small quantities. There is relatively small demand for carloads.

St. Louis, by Telegraph.—Conditions are without change in the Barb Wire department of the market, and the demand ruling is said to be good for the season. Jobbers quote carload lots of Painted at $2.75, and Galvanized at $3.05; less than carload lots at $2.80 for Painted and $3.10 for Galvanized.

Pittsburgh.—The market is dull, and as competition for the small amount of business being placed is very keen, prices are being shaded. For domestic trade established prices are as follows: Galvanized Barb Wire, $2.90 in carload lots to jobbers, and Painted, $2.60. Terms 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh. However, the above prices do not longer acurately represent the market, but are being shaded.

Plain Wire.—Requirements for Plain Wire come from manufacturers of Wire products, who are anticipating an active demand for the coming year. Shipments are also being made on contract orders by the mills. There is some unevenness in prices. Regular quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

Base sizes.	Plain.	Galv.
To jobbers in carload lots	$2.25	$2.65
To jobbers in less than carload lots	2.30	2.70
To retailers in carload lots	2.35	2.75
To retailers in less than carload lots	2.45	2.85

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9	Base				$0.40	extra.
10	$0.05	advance	over	base	.40	"
11	.10	"	"	"	.40	"
12 and 12½	.15	"	"	"	.40	"
13	.25	"	"	"	.40	"
14	.35	"	"	"	.40	"
15	.45	"	"	"	.75	"
16	.55	"	"	"	.75	"
17	.70	"	"	"	1.00	"
18	.85	"	"	"	1.00	"

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Chicago, by Telegraph.—A revision of store prices for Plain Wire brings quotation down to $2.30, either for carloads or small lots. Trade is unsettled, but a heavy business from mill is reported.

St. Louis, by Telegraph.—The demand for Plain Wire is reported in fair volume, and jobbers quote No. 9 at $2.40 to $2.45, and Galvanized from $2.80 to $2.85, with the usual advance for other sizes.

Pittsburgh.—While the buyers have not yet commenced to place orders for Wire for spring delivery, makers of Fence Poultry Netting and other Wire products are placing liberal orders. Prices are shaded very materially, depending on the nature of the order. Regular quotations are as follows:

To jobbers in carload lots	$2.25
To jobbers in less than carload lots	2.30
To retailers in carload lots	2.35
To retailers in less than carload lots	2.45

Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, $1 advance. Terms are 60 days net, with 2 per cent. off for cash in 10 days, f.o.b. Pittsburgh.

Wrought Butts.—Under date November 27 the manufacturers of Wrought Butts issued revised discount sheets in which advances of about 10 per cent. are announced, as the base discount is diminished. The present base discounts on this line of goods are as follows, an extra 25 per cent. being obtainable:

	Discount.
Table Hinges and Back Flaps	60 %
Loose Joint Butts	60 %
Narrow Butts	60 %
Broad Butts	60 %
Light Loose Joint, Narrow and Reversible	60 and 10 %
Loose Pin Butts	60 and 10 %
Light Inside Blind Butts	60 and 10 %
Light Loose Pin and Loose Joint Butts	60 and 10 %
Loose Pin Ball and Steeple Tip Butts	75 %
Loose Joint Ball and Steeple Tip Butts	75 %

Strap and T Hinges.—In connection with the advance on Wrought Butts mentioned above a similar advance was made in the price of Strap and T Hinges, the new base discounts being as follows, beyond which an additional 20 per cent. is frequently given:

Light Strap Hinges....70 %
Heavy Strap Hinges....75 and 10 %
Light T Hinges....66⅔ %
Heavy T Hinges....60 and 5 %
Extra Heavy T Hinges....75 %

Sheet Zinc, Nickel Plated.—A. Klein, 453-455 Broome street, New York, is the sole agent in the United States for German made Sheet Zinc, Nickel Plated on one side, manufactured by the German Nickel Zinc, Steel and Tin Sheet Factory, Essen, Germany. This Nickel Plated Zinc is used for the manufacture of a variety of specialties requiring a ductile metal not likely to tarnish. Importation orders are taken f.o.b. Hamburg or Bremen. The material comes regularly in sheets 20 x 20 inches, in cases of 220 pounds, and 20 x 40 inches, in cases of 440 pounds. The following are the current net quotations for import, in German marks (24 cents) per 100 kg. (220 pounds):

Nos.	Gauge in millimeters, exact.	Approximate decimals of inch.	Marks per 100 kilos.
0	.050	.002	..
½	.075	.003	..
1	.100	.004	..
2	.143	.0055	98
3	.186	.0075	87
4	.228	.009	82
5	.250	.01	77
6	.300	.012	76
7	.350	.014	74
8	.400	.016	73
9	.450	.018	72
10	.500	.02	71
11	.580	.023	70.50
12	.660	.026	70
13	.740	.029	69.50
14	.820	.032	69
15	.950	.038	68.50
16	1.080	.04	68
17	1.210	.05	68
18	1.340	.052	68
19	1.470	.056	68
20	1.600	.063	68

Nos. 0, ½ and 1 can be made, but for ordinary use are too thin. This material, if necessary, can be supplied with both sides nickeled.

Building Papers.—The business in building papers is very good, and, as predicted some time ago, prices have stiffened somewhat. Manufacturers of Rosin Sized Sheathing, we are credibly informed, have recently agreed on a uniform price, which shows an advance over previous quotations of $2 to $3 a ton, the price in round lots being now $25 per ton. By the roll, light, medium and heavy weights are quoted 32, 47 and 58 cents per roll, respectively, equivalent to about $32, $31 and $29 per ton, which is a delivered price. Deafening Felts, 9, 6 and 4½ square feet to pound, have been advanced to $40 to $42 per ton, an upward movement, however, that always occurs at this season of the year from the nature of the product. In Tarred Roofing Felt, one ply, the price has been advanced to $28 to $30 per ton, current prices on the two and five ply goods, remaining at 40 to 45 cents and 60 to 65 cents per roll respectively. This has been occasioned by an advance in the price of paper for the Saturated or Tarred Roofing Papers, which, in large lots to jobbers, is now $38.50 per ton.

The Stanley Works.—Under date November 27 the Stanley Works, New Britain, Conn., and 79 Chambers street, New York, issue a discount sheet as follows, announcing advance in the price of Wrought Steel Butts and Strap and T Hinges. The Butts are subject to an additional discount of 25 per cent., and the Strap and T Hinges to an additional discount of 20 per cent.:

Bright Steel Butts.

From list prices in 1895 catalogue:

Discount.
Bright Steel Butts, Nos. 800, 802, 804, 806, 808, 810, 814, 816, 818, 820....60%
Bright Steel Butts, Nos. 826, 834, 836, 838, 840, 842, 843, 844, 845, 846, 848....60-10%
Bright Steel Butts, Nos. 822, 822½, 823, 823½....75%

Strap and T Hinges.

From list prices adopted March 15, 1901:

Light Strap, No. 900....70%
Heavy Strap, No. 902....75-10%
Light T, No. 904....66 2-3%
Heavy T, No. 906....60-5%
Extra Heavy T, No. 908....75%
Long Chest, No. 910....55%
Hinge Hasps and Staples, Nos. 912, 913, 914....55%
Crate Hinges, No. 916....70%
Crate Hasps, Nos. 918, 920....55%
Corrugated Heavy Strap, No. 935....75-10%
Corrugated Extra Heavy T, No. 937....75%

Japanned and Galvanized Hinges.

From list prices in 1895 catalogue:

Japanned Light Strap, No. 952....55%
Japanned Heavy Strap, No. 954....50-5%
Japanned Light T, No. 956....55%
Japanned Heavy T, No. 958....50-5%
Japanned Extra Heavy T, No. 960....50%
Japanned Hinge Hasps, No. 964....45%
Japanned Long Chest, No. 962....50%
Japanned Crate Hinges, No. 970....55%
Galvanized Hinges with iron pins, Nos. 1300, 1302, 1303, 1304, 1305, 1306, 1307, 1308....65%
Galvanized Hinges with brass pins, Nos. 1300¼, 1302¼, 1303¼, 1304¼, 1305¼, 1306¼, 1307¼, 1308¼....60%

Cordage.—The Rope market has shown no particular change for the past week or two. Business is of moderate proportions in Manila and Sisal Rope at unchanged quotations. These vary with different manufacturers, as follows, on a basis of 7-16 inch and larger: Sisal Rope, 8½ to 9¼ cents; Manila Rope, 12¾ to 13 cents, with ¼ cent rebate per pound in large quantities allowed on both kinds of Rope.

Glass.—The local Window Glass market remains in about the same condition as last week. The local demand is light, with prices ranging from 90 to 90 and 5 per cent. discount. Quotations of 90 and 10 per cent. are reported, but without confirmation. Carload lots, f.o.b. factory, are quoted at 90 and 12½ per cent. discount. The jobbers' association quotations, on both double and single strength, over the entire country, are as follows:

Discount.
Less than car lots from store....90 %
Carloads from store....90 and 7½ %
Carloads, f.o.b. factory....90 and 12½ %

Paints and Colors.—*Leads.*—The market for White Lead in Oil has been quiet and featureless. The outlook for the future is viewed with a good deal of confidence by the trade in general. Quotations are as follows: In lots of 500 pounds or over, 6½ cents; in lots of less than 500 pounds, 7 cents per pound. It is reported that the Union Lead & Oil Company are negotiating for a site at St. Louis, upon which to erect a large White Lead manufacturing plant. It is understood that the company are half owners in the Federal Lead Company, recently organized under the laws of New Jersey.

Oils.—*Linseed Oil.*—The Linseed Oil market is in rather an unsettled and perplexing condition. Locally there are few, if any, carload buyers, as a large lot of Oil was disposed of last week for delivery early next year. Oil which was bought at about 40 cents some time ago is now being offered in some cases below 50 cents per gallon. The Flax Seed market fluctuates from day to day, and is not strengthened by Seed sold for export, which is now being offered for sale. On the other hand, Oil at 50 cents per gallon, it is said, does not represent any profit to the crusher at the prices which have been paid for Seed. Under normal conditions Oil should be low in price during the month of December and January. It is difficult to determine what the immediate future of the Oil market will be under present conditions. City Raw Oil is quoted at 55 cents in small lots, and out of town Oil at 53 cents per gallon. Out of town Oil, in carload lots, is quoted at 50 cents per gallon.

Spirits Turpentine.—The strength of the local market is attributed to favorable reports from the South. Demand is limited at this point, with prices firm. Quotations, according to quantity, are as follows: Southerns, 37½ to 38 cents; machine made barrels, 38 to 38½ cents per gallon.

The Humphreys-Davidson Hardware Company, Wytheville, Va., will open about January 1 an up to date Hardware store. They will carry in stock a full line of Shelf and Heavy Hardware, also Stoves and Agricultural Implements. The officers of the company are as follows: M. H. Davidson, late of Roanoke, president; H. O. Humphreys, late of Bedford City, vice-president; W. S. Humphreys, late of Bedford City, secretary and treasurer.

SHOW WINDOW DISPLAY.

The trade are invited to contribute information in regard to methods which have proved satisfactory, with descriptions of attractive displays. Inquiries also are solicited, to which careful attention will be given.

HAVANA HARBOR.

A window display that attracted much attention and kept a crowd of interested spectators in front of the Hardware store of C. Magnussen, Lyons, Iowa, both during the daytime and evening, is shown in Fig. 1. The

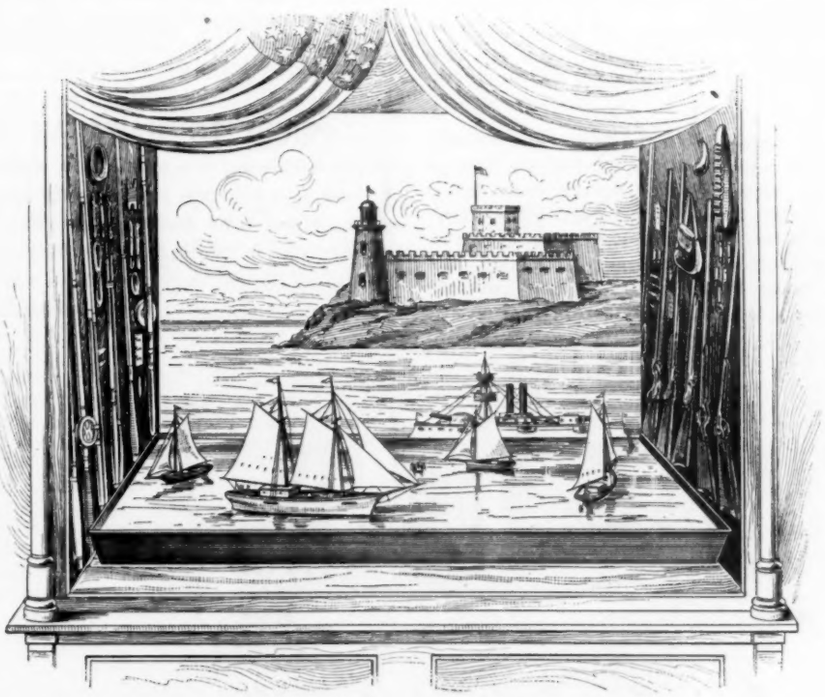


Fig. 1.—Havana Harbor.

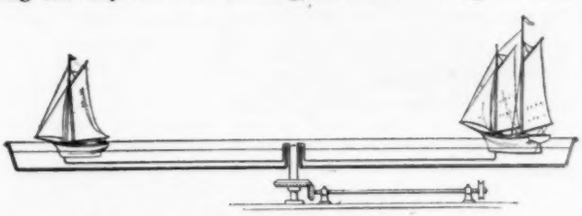
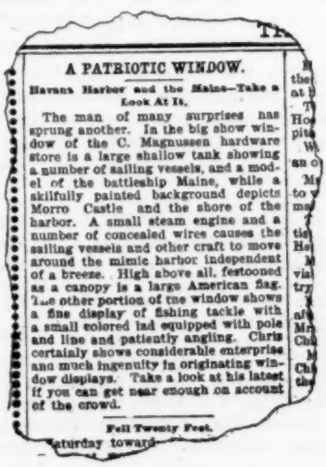


Fig. 2.—Mechanism by Which Ships are Moved.

background was formed of a painted picture of Morro Castle, in front of which was placed a model of the ill fated battle ship "Maine." In the bottom of the window was set a pan 6 feet square and 5 inches deep. In the center of this pan was soldered a ½-inch pipe, a hole being left in the bottom of the pan. Through this pipe was run a small shaft, to which were fastened wire arms, the sail boats being attached as shown in Fig. 2. To the lower end of the vertical shaft was fastened a beveled gear, taken from an egg beater, which worked in another beveled gear on a horizontal shaft. On this shaft was a grooved pulley. The pan was filled with water and the grooved pulley connected with a small steam engine of 1-40 horse-power, that caused the boats to revolve slowly. The side walls of the window were used to display Guns and Fishing Tackle. Fig. 3 shows the write-up given the display in the local paper. These notices can generally be secured if the dealer advertises and makes a request for them when he has something of particular interest in his window.



A PATRIOTIC WINDOW.

Havana Harbor and the Maine—Take a Look At It.

The man of many surprises has sprung another. In the big show window of the C. Magnussen hardware store is a large shallow tank showing a number of sailing vessels, and a model of the battleship Maine, while a skilfully painted background depicts Morro Castle and the shore of the harbor. A small steam engine and a number of concealed wires causes the sailing vessels and other craft to move around the mimic harbor independent of a breeze. High above all, festooned as a canopy is a large American flag. The other portion of the window shows a fine display of fishing tackle with a small colored lad equipped with pole and line and patiently angling. Chris certainly shows considerable enterprise and much ingenuity in originating window displays. Take a look at his latest if you can get near enough on account of the crowd.

Fell Twenty Feet.

Fig. 3.—Clipping from Local Paper.

A HARDWARE LOCOMOTIVE.

A locomotive 42 inches long and 20 inches high stands in the show window of A. W. Gerstner, 632 to 634 Eighth avenue, New York. It is constructed entirely out of articles taken from their stock by Sidney Stansbury, one of the clerks, who claims it contains some radical improvements over the famous Empire State engine, No. 999, after which it was modeled.

The several parts of the locomotive were made up as described below:

Boiler, two plumbers' Furnaces.
Head of Boiler, one Ventilator.
Front Truck, four Hand Drills.
Platform for Truck, two Squares and six Scale Rules.
Cylinders, two piano makers' Glue Pots.
Steam Chest, four Pocket Levels, four Scrapers.
Steam Pipe, two Blow Pipes.
Cow Catcher, six Calipers.
Draw Head, Dowel Pointer and Wire Cutter.
Front Rod to Boiler, two legs for Starrett's Dividers.
Piston Rod, two legs for Starrett's Dividers.
Frames and Guides for Piston Rod, two Hack Saw Frames.
Westinghouse Air Brakes, two Chucks.
Shoe for same, two Thread Gauges.
Connecting Rod for Driving Wheels, two Saw Blades.
Cab, Hack Saw Frames and Blades.
Smoke Stack, one plumbers' Grease Cup.
Head Light, one Pocket Lantern.
Bell, one Hand Bell.
Sand Box, one Brazing Lamp.
Sand Box Tube, two Blow Pipes.
Whistle, one Brazing Lamp.
Hand Rails on Boiler, two bell hangers' Bits.
Walk along Boiler, two Steel Rules and two Brass Rules.
Smoke, Russia Hemp Rope.

Telegraph Poles, three Ship Augers.
Railroad sign, one Surface Gauge.
Side Lights, two Alcohol Torches.
Eccentric Rods, two Blow Pipes.
Fire Box, two Combination Squares with center heads.

The four driving wheels are 8 inches in diameter, each being brass bound. The hubs of each are made of Wire Gauges. The spokes of the first is composed of a pair of Starrett's Cutting Nippers, two Thread Calipers and Center Punch; the second of two Center Heads, two Scale Rules, four Twist Drills and two Flat Metal Drills; the third of four Pin Vises and four Screw Driver Bits, and the fourth of one pair of Hall's Cutting Nippers, one pair End Cutting Nippers and five Taps. Electric Wire Couplings were used for the driving rod pins. The track is made of Saw Webs and the ties of 2-Foot Rules.

C. F. Myers has succeeded to the business formerly conducted under the style of E. J. Post & Co., Albuquerque, N. M. Mr. Myers clerked for 12 years for a Hardware house in St. Louis before coming to Albuquerque, and entered the employ of E. J. Post & Co. in 1889. He was admitted to an interest in the firm on January 1, 1891. Since 1894 Mr. Myers has had full charge of the business, Mr. Post having retired from active participation. A wholesale and retail trade is done, principally wholesale, in Hardware, Shelf and Heavy, Stoves, Tinware, Farming Implements, Sporting Goods, &c.

Urias Menser, Culver, Ind., has disposed of his Hardware, Farm Implement, Buggy and Wagon business to Wm. and Frank Cook, of Leiters Ford, Ind., who will take possession about the first of the year.

Lee & Pollock have purchased the Hardware, Stove, Farm Implement, Harness, Buggy and Wagon business of A. F. Schofield, Collinsville, Ind. Ter., and will continue at the old stand.

M. J. Showers has lately embarked in business in Apache, Oklahoma. His line comprises Shelf and Heavy Hardware, Stoves and Tinware, Sporting Goods, &c.

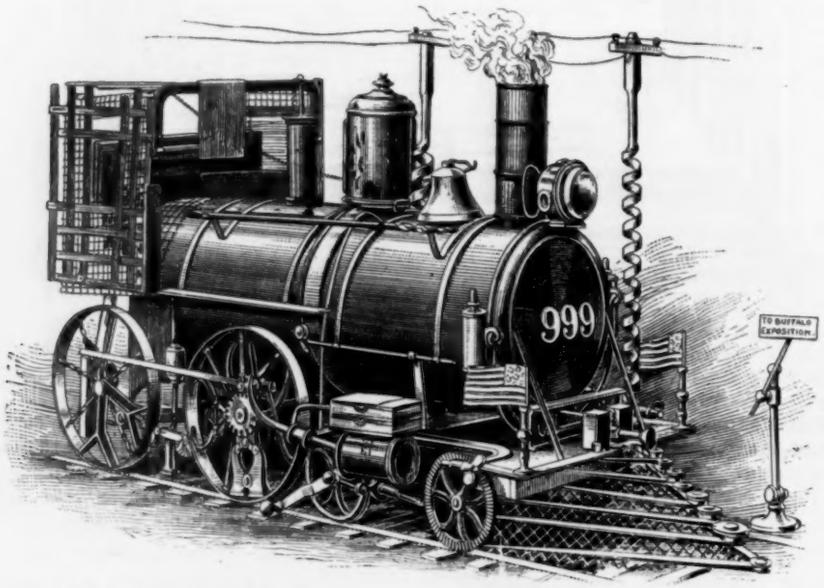
THE NATIONAL VISE & TOOL WORKS, Camden, N. J., advise us that they have just shipped to Honolulu, Sandwich Islands, a large number of Snediker Blacksmith, Leg Vises and XL Vises, and have recently exported the same line of goods to London, England; Glasgow, Scotland, and to various points in India.

CROSSMAN EDGE TOOL COMPANY.

CROSSMAN EDGE TOOL COMPANY have been organized at West Warren, Mass. The company will be incorporated under the State laws. Work will be immediately begun in preparation for resuming operations at the plant. The following officers have been elected: President, Caspar Ranger; clerk and secretary, William E. Bosworth; treasurer, John T. F. MacDonnell; superintendent and manager, Amory Crossman; Board of Directors, Amory Crossman, Caspar Ranger, Dennis F. Cleary, William Reardon, Patrick J. Kennedy, John J. Burke and Jacques Bouthillier. Mr. Crossman's father and grandfather were identified with the Edge Tool manufacturing business for many years.

PRICES TO HAWAIIAN ISLANDS.

THE following communication touches upon a matter to which we have already alluded in these columns. There is no doubt that while many manufacturers are properly treating the Hawaiian Islands as part of the United States, there are others who are giving them the benefit of the lower prices which in many cases are made to merchants in foreign countries. The subject is thus touched upon by our correspondent.



A Hardware Locomotive.

Your journal has from time to time called attention to the demoralizing practice of many American manufacturers of still continuing "export prices" in the Hawaiian Islands, notwithstanding the fact that these islands are now part and parcel of the United States.

There are no custom house restrictions between the two countries to prevent goods sold at the export price being re-entered in the United States, which has been and is being done, to the great detriment of many of your readers.

It would be the proper thing if all manufacturers would take the same view of it as a leading manufacturer, who recently wrote a letter as follows:

> We discontinued the use of export prices for the Hawaiian Islands some time ago, as we now consider that this united country is a part of the Great Republic. We do not see any logical reason why its inhabitants, in consideration of the great privilege of flying the Stars and Stripes, should not pay the present high American values on the commodities they consume.

This hits the nail on the head, and we hope the publication of this letter will enlighten some American manufacturers who do not seem to know that the Hawaiian Islands are no longer export, but domestic trade.

Hardware Organizations.

Chicago Retail Hardware Association.

At the last regular meeting of the Chicago Retail Hardware Association the Buying Committee reported the quotations they had received on Wire Cloth, Wire Goods, Garden Hose, Gasoline Stoves, &c., and estimates were given by the members present as to the quantities of these goods they would require to meet their wants for the coming season.

In the November issue of the "Bulletin" published by the association, under the heading of "Grievances," appears the following:

> We have been having some correspondence with the ——— —— ——— with regard to their alleged selling direct to consumers. The matter will be fully entered into at our coming meeting. We earnestly hope that this matter may be adjusted satisfactorily to all parties concerned, as it is not the policy of this association to treat any wholesale house that will give us as retail Hardware merchants fair treatment other than in a friendly manner.
>
> Our Grievance Committee has in hand a complaint by one of our members against one of the jobbing houses of this city for persistently selling to our members' customers. If we as retailers expect to continue doing the retail Hardware business of Chicago it will be necessary to oppose this custom of the several Hardware jobbers and manufacturers attending to this retail business for us.
>
> Some years ago some of the wholesale houses occasionally nibbled at an order from a consumer—cautiously of course. This branch of their trade has been spreading out much more than most of us realize. It will not do to ignore this condition of affairs and some step on our part is absolutely necessary. The longer we postpone this action just so much harder the problem will be. We are receiving the excuse from offending parties that they are doing a retail business, not because they like it, but because the other jobbers are retailing. Now we all know that this is not the fact, and we should not entertain such an argument for a moment.

Under the head of "State Association Notes" is the following reference to a complaint which is awaiting adjustment:

> The Investigating Committee of the Illinois Retail Hardware Dealers' Association has in process of adjustment a complaint made by one of the members residing in Springfield. This Springfield member had purchased Gasoline Stoves for several years past, and claims that he purchased his line this year on the same terms as he had done in the past—that is, that he had been the exclusive agent in Springfield for that line of goods. He also claims that the manufacturer sold a large bill of the same class of goods under the same name to a department store in Springfield, after having taken complainant's order. Furthermore, that the offending party sold the goods at a much lower price to the department store. Furthermore, that the party offending refused to adjust the matter in any way. Later on the complainant requested permission to return his Stoves or to be made a rebate on his Stoves, placing him in a position to meet the competition of the department store. All of these requests were steadfastly refused, the manufacturer insisting on payment of his Stoves at prices agreed upon when the goods were purchased, the manufacturer also maintaining that he had made no agreement as to exclusive agency with the retailer making the complaint. Final adjustment of this matter will probably not be made until the next annual meeting of the Illinois Association, when both sides should be heard so that all of the facts may be brought out satisfactorily, &c.

Monongahela Valley Retail Hardware Dealers' Association.

Reference was made in our last issue to a conference called by the Monongahela Valley Retail Hardware Dealers' Association, to which the Hardware merchants of that State have been invited. We are, however, advised by J. F. Frye, Charleroi, Pa., secretary of the association, that the date of the meeting has been changed to Thursday, December 12. The Monongahela House, Pittsburgh, will be the scene of the gathering.

Indiana Retail Hardware Dealers' Association.

M. L. Corey, Argos, Ind., secretary and treasurer of the Indiana Retail Hardware Dealers' Association, has issued the following circular under date November 30, in which announcement is made of the time and place of the next annual meeting, together with some remarks concerning the work of the association and what has been accomplished through its efforts:

> The next meeting of the Indiana Retail Hardware Dealers' Association will be held in Indianapolis, February 19 and 20, 1902. Headquarters at the Hotel Denison. This meeting promises to be the best and largest in our history. We expect to profit by past experience in arranging programme and discussions to the extent that no dealer who is progressive can afford to stay away. The social feature will not be neglected, but this year the entertaining will be done by the association without asking outside aid.
>
> We have received about 50 applications recently, and the feeling expressed by dealers of our State who are not yet members shows they are interested and appreciate our efforts. We ask every one expecting to attend and join us at our meeting to write the secretary at once, so that proper arrangements can be made.
>
> Quite a number of complaints have been filed this term, but nearly all have been satisfactorily adjusted. Present conditions show more harmony between jobbers and dealers than heretofore. Jobbers are respecting our rights and grounds (with a very few exceptions), and find they gain by adopting this course.
>
> Some trade papers claim that dealers are buying more from manufacturers direct than heretofore. This may be true in some places, but the contrary generally prevails. Some goods (specialties particularly) always will be bought direct from manufacturers, because as a rule jobbers cannot guarantee an exclusive vicinity sale contract. The jobber that caters to dealers only, and is not enjoying a good business, must look for some other cause for the difficulty.
>
> There are still a few jobbers who do not deserve our patronage. Their course demoralizes our business, and encourages undue and illegitimate competition. They solicit the jeweler, druggist, grocer, department store, mill man, blacksmith, lumberman, contractor and even the consumer, and then expect the retail dealer to buy of them. A more absurd proposition would be hard to name, yet some dealers patronize them knowing the conditions.
>
> Again, we have a class of so-called wholesale and retail people who use jobbers' rating in obtaining lower prices, abusing the privilege to dispose of surplus stock. Very often the latter class are our worst price cutters. When the consumer states he wants to see "Jones before he buys" their regular statement is, "He can't sell at this figure; why he buys of us." The Lindsay Hardware Company recently announced their policy in a booklet sent out to the trade. They say: "We will not sell to contractors, blacksmiths or consumers of any kind under any circumstances. We do not try to get your customers, but will rather help you to keep them. We do everything we possibly can to protect the retailer. We do a wholesale business, nothing else." This statement every association member must approve.
>
> We believe there is a more general disposition to act fairly—to sell better goods on a profitable basis, to assist each other in supplying the entire wants of the consumer instead of allowing this trade to go to mail order houses or bogus bargain leader concerns. There is a more friendly feeling and better understanding between competitors than ever existed before, and we welcome and encourage it all, for to this end associated effort has been directed.

Chicago Hardware and Manufacturers' Club.

The success of the Hardware and Manufacturers' Club of Chicago is now assured, and the Committee on Organization have made arrangements with the Technical Club of that city to share their quarters. The organization are thus enabled to open up in their own clubhouse, and the committee feel confident the arrangement made will be satisfactory to all. The Hardware and Manufacturers' Club will maintain their own identity, using their own stationery, &c., and the two clubs

will be entirely separate and distinct. During the month of December members of the new club will be given cards entitling them to the privileges of the Technical Club, although their dues will not commence until January 1.

Washington Hardware Association

As noted in the report of the annual meeting of the Western Washington Hardware Association in our last issue, it was decided to enlarge the scope of the organization, and the name was changed to that of the Washington Hardware Association. While this was designated as the third annual meeting of the association, the term is somewhat misleading, as the organization is but 18 months in existence, the first convention having been held on April 19, and the second convention on November 14, 1900. At the meeting held a year ago the secretary reported that they had doubled their membership in seven months, and expresed the hope that they would double it again during 1901. This they failed to do, the membership being increased by 12, making the total 47 at the time of the recent meeting. This, however, was regarded as a very healthy growth for an 18 months old organization, as there are less than 90 Hardware merchants in Western Washington, so that more than half of them have already affiliated with the association.

Mr. Reckers, the secretary, in his annual report referred to the good work done through the local organizations in Seattle and Tacoma in the matter of price agreements and overcoming trade abuses. The local jobbers were ready to pledge themselves to give the smaller towns the same support as they had the merchants in the two larger cities, if local organizations were formed.

Mr. Mohr, in his presidential address, referred to the great object of the association as to cultivate a more fraternal feeling and hearty co-operation among Hardware merchants. He said that when merchants act upon the theory that their competitors are as honest as themselves and have the same lofty purposes in view, they will have learned a valuable lesson. He desired to impress every merchant in the State with the importance of association work as he felt it, and expressed the hope that the day would soon come when all, or nearly all, of the legitimate Hardwaremen of Washington would be affiliated with the association.

San Francisco and Oakland Retail Hardware Dealers' Association.

The second annual banquet of the San Francisco and Oakland Retail Hardware Dealers' Association will be given at the Maison Tortoni, San Francisco, on Friday evening, December 6. The association have arranged to bring together on this occasion as many as possible of the Hardware merchants, both jobbers and retailers, of the vicinity, and an exceptionally interesting and enjoyable gathering is expected.

Illinois Retail Hardware Dealers' Association.

The Executive Committee of the Illinois Retail Hardware Dealers' Association will meet in Decatur at an early date, to make final arrangements for the annual meeting, to be held some time in February next.

SAVAGE ARMS COMPANY'S NEW CATALOGUE.

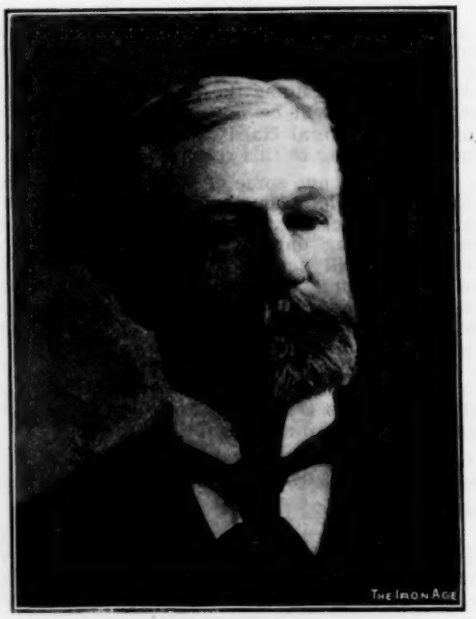
THE SAVAGE ARMS COMPANY, Syracuse, N. Y., have just issued an illustrated catalogue of their product for 1902. In its 60 pages are shown the various grades of the Savage Rifle, model 1899, together with hammerless Military and Sporting Rifles, Carbines, Reloading Tools and Sights, and Metallic Ammunition of their manufacture. An announcement in the latter part of the book calls attention to the Savage Magazine Rifle, .22 caliber, now in course of manufacture, which will be ready for delivery about March, 1902. It will be of entirely new design and can be used in connection with the regular .22 caliber cartridges now on the market. It is said to embody new features and unique simple mechanism, it being a take-down magazine Rifle especially designed to be easily taken apart and cleaned.

DEATH OF H. H. BEACH.

HENRY HOWARD BEACH, whose portrait is here given, died at his home in Newark, N. J., Sunday, December 1, aged 51 years, of a complication of diseases, which are believed to have had their origin in a strain some years ago.

He began his business life with a broker in Wall street, but, wishing to learn the Hardware business, entered the employ of Russell & Erwin Mfg. Company, where he worked up from stock clerk to the entry desk.

About 1874 he went with the Hardware jobbing house of J. Clark Wilson, 81 Beekman street, and about a year later, owing to their retirement from business, went with Graham & Haines, 88 Chambers street, by whom he was employed as an entry clerk. Two years later, in 1877, he began to sell goods, and ever since he has most accept-



HENRY HOWARD BEACH.

ably represented that house, and their successors, John H. Graham & Co. as a traveling salesman.

He was well liked by the trade he called on, and was held in high esteem by his fellow travelers and associates. He was energetic, conscientious, capable and faithful to the interests of his house, by whom his work was thoroughly appreciated. He was kind, considerate and indulgent, providing generously for his family as husband and father, as well as others who were, in a measure, dependent on him.

The funeral services were held from his late residence Wednesday, December 4. He is survived by a widow and three daughters, two of whom are grown, the third being about ten years old.

CENTRAL TOOL COMPANY.

CENTRAL TOOL COMPANY, Jonesboro, Ind., have been organized for the purpose of manufacturing a line of Agricultural Edge Tools. H. E. Marks is secretary of the company, and J. E. M. Rogers treasurer, Lewis A. Bartlett, who is referred to as an expert in Scythe making, being superintendent. The company have just completed a modern and economically arranged plant and are now in a position to fill the orders of the trade. They advise us they are manufacturing a full line of Scythes, Hay Knives, Corn Knives and Grass Hooks.

NOTES ON FOREIGN TRADE.

BRITISH LETTER.

Office of *The Iron Age*, HASTINGS HOUSE, NORFOLK ST., STRAND, LONDON, W. C. Nov. 23, 1901.

The State of Trade.

THERE has been no special change in the conditions of trade since my last report. There is a fair degree of activity in the Christmas trade, but by no means equal to what it has been during recent years. Electroplaters are busy both in Sheffield and Birmingham, so also are the various makers of Hardware specialties, but this "busyness" is after all only comparative. It may be said that buying is not brisk with regard to the lighter kinds of Hardware. One or two of the shipping merchants report that they are still sending large consignments to South Africa, and they are in hopes of trade improving shortly. It is to be hoped that they will not be disappointed. Considerable fears are expressed on all hands as to the effect of the new Australian tariff, but New Zealand is taking heavy parcels of assorted goods, while orders continue to come in in considerable quantity and value from India and South America. Travelers' reports during the past week have been more hopeful than for a month previously. Builders' Hardware is still in demand for export, while stampers and japanners are well employed. There is continued fair demand for Locks of a good quality, but cheap Locks are at present a drug. Galvanizers are busy on export account. In Sheffield a serious dispute has cropped up in the Britannia metal trade. The men have asked for concessions both in payment and conditions of work which the masters have refused. The old grievance of apprenticeship is up again. The men, by reason of superior organization, have been able to limit the number of apprentices, with the result that labor is scarce, which naturally places the employers at a disadvantage. At this time of the year there is generally a brisk demand for all forms of good Cutlery, but so far as hafting material is concerned the trade is quieter than it has been for a long time. There is practically no demand for certain classes of Ivory and Stag Handles. Some Cutlery firms are making no more stock, and will consider themselves lucky if they can get through all their Christmas stock this year. Sheffield is still sending to America large consignments of Machete and Sugar Knife Handles. In other words, while both in Birmingham and Sheffield the demand for heavy material continues brisk, and particularly for Iron, trade is discouraging so far as light Hardware is concerned. Were it not for the export trade we should be in a bad way.

The Tin Plate Trade.

In South Wales one or two tin plate works have had to stop for a short time during the past week for want of fuel. For a long time past the bulk of the tin plate works have been buying fuel from hand to mouth, owing to its high cost and a hope, if not a belief, that prices would shortly come down. Those who have a tin plate trade report it as good and at remunerative prices. One or two tin plate works are using German steel bars, but the results are not encouraging. Curiously enough, these works report a shortage of men. The great fear now is that in consequence of the slight spurt in the tin plate trade other mills will open and so lead to competitive cutting.

The South American Trade.

The attention of American exporters should be called to the great strength of British exporters in South America, and particularly in the Argentine. The Hardware trade in the Argentine is slowly becoming simplified. During the past ten years direct importation, both by large and small firms, has been a trade custom, but recently the smaller houses have gradually ceased importing, being overborne by the larger houses who possess larger capital. The result is that in Rio de Janeiro there is growing up a number of reputable jobbing houses whose trade is well worth cultivating. Shipments from Great Britain far exceed those of any other country. Here and there the United States and Germany are gaining ground, particularly in Copper Wire, Worked Tin and Worked Zinc, but in these three lines the United States has keen competitors in Germany and Belgium. The United States has practically secured the market for Barbed Wire, but Bar Iron, Sheets and Pig Iron still come mainly from Great Britain. British exporters still hold the trade in Tubes, Galvanized Iron and Black, while in general Hardware, as I have remarked, the trade is practically British. There has been recently a slight revolt against British exporters whose terms are cast iron, but there is now observable a tendency to return. Germany is sending over cheap lines of rough Iron Padlocks, fancy carved Pocket Knives and Hunting Knives. Rough Padlocks for chests and trunks can be made much cheaper than in Great Britain, while the Pocket and Hunting Knives are got up more attractively. The United States has the trade in Cut Tacks, but Germany holds its own for Brass Headed Nails. Hoes, Picks, Edged Tools and Shovels are still entirely imported from Great Britain. Files have latterly been imported in small quantities from Germany, but they have not given satisfaction, and the British File has again secured the market. Wire Nails are made in the Argentine, several important factories being there, so that there is practically no importation of them. The wire used comes from Germany. In this line Germany has actually supplanted the United States. Door Handles, special Door Locks, Escutcheons, Keys and other door furniture come principally from France. The United States has the trade in Trunk and Chest Locks and Stamped Colored Tinned Sheets for covering trunks, and also a great many household novelties. With the exception of Cast Iron Enameled Sinks, which are bought from Germany at prices varying from 30 to 40 per cent. cheaper than the British, Great Britain has the bulk of the trade in Cast Iron Enameled and Tinned Hollow Wares. Great Britain also has the trade in gas, water and sanitary appliances, but latterly a few Cast Iron Enameled Baths have been obtained from the United States. It is reported that they are quite as cheap and as good as the Scotch Bath. Perhaps when better shipping facilities have been assured between New York and South America this trade can be secured.

The Mediterranean Trade.

With improved shipping facilities between America and the Mediterranean there is reason to believe that a greatly increased trade in American Hardware can be done by countries touching or near to the Mediterranean. Thus, last year into the district of Bosnia and Herzegovina was sent 15,812 tons of Iron and Ironmongery and 2751 tons of Machinery. The town of Tangier bought last year $6000 of Tools, $3200 cheap Knives, not a cent's worth apparently coming from the United States. Palermo in Sicily is also a lively little market. Thus, during the past 18 months it has purchased 1,200,000 kg. of Iron and Steel Bars, 1,300,000 kg. Iron and Steel Plates, over 3,000,000 kg. Steel Rails, 200,000 kg. Tubes, 350,000 kg. Galvanized Iron Sheets, 73,000 kg. Copper and Brass goods, 190,000 kg. Zinc goods, 1,172,000 sporting and other Guns, 1,845,000 Revolvers. As there are direct shipments from the United States to Palermo, amounting during 18 months to 380,000 kg. of lard, there seems no particular reason why Hardware goods should not be included. Traveling further up the Mediterranean, it is worth knowing that as soon as your little reciprocity difficulty with Russia is amicably settled Odessa wants to buy in increased quantities Agricultural Machinery, Bicycles, Sewing Machines, Iron Bedsteads, Tools and Cutlery. Last year Odessa imported 11,880 tons of Iron, 915 tons of Tin, 2383 tons of Lead, 336 tons of Manufactured Tin, 290 tons of Shovels, 1561 tons of Machinery and 1060 tons of Agricultural Implements. In connection with the Mediterranean trade, too, I may remark that there has recently been a marked improvement in the economic condition of Italy. The last report of the Italian Chancellor of the Exchequer indicated this unmistakably. About three months ago, also, I went into some detail as to

the possibilities of increasing American trade with Spain.

More Exhibitions.

There is at present in this country a special commissioner from the Japanese Government with a view to secure exhibitors at an exposition to be held at Osaka in 1903. This indicates a change in the policy of the Japanese Government, because hitherto this exhibition has been almost exclusively for Japanese products. Special buildings are this time to be added for the display of European and American manufactures. No charges will be made for space or motive power, and goods for exhibition will be admitted duty free. The exhibition will open in March, 1903, and will remain open until the end of July. There is to be an exhibition at St. Petersburg on June 3 next, remaining open until September 2, for British manufactures and merchandise. I have previously referred to this exhibition and am glad now to be able to give the specific dates.

Freights to South Africa.

The following letter, written by a firm of British exporters, while not pleasant reading for those interested in the development of British trade, can at least be read with some complacency by American exporters: "The question of freights to South African ports is a terrible one to contemplate for the British producer and is one for our Government to take up, unless our trade is to be absolutely strangled. Both America and Germany are prepared, when the time comes, to put goods down at half the cost of our shipping companies, and the question is, Are our industries to be ruined by a ring of monopolists who are driving the trade in our own colonies to alien markets? Is it not time the Government stepped in to counteract the mischief that threatens us? Even if they spent a few hundred thousands a year in subsidizing a company, as Germany does, and regulating the tariffs, it would be as nothing compared to the savings to our industries and our general welfare. I am fairly convinced of the imperative necessity of protecting our industries, for in this market a monopolist like —— ——, who, having the control of our shipping, does not scruple to go to an alien market (*e. g.*, New York), and carry our competitors' goods 15 to 20 shillings under what he charges us, simply means strangling our producers, and as our very existence depends upon him it ought not to be in the power of any man or body of men to exercise this control, the welfare of the whole nation being at stake. I have been imbued with the principles of free trade all my life, but there are conditions which are new to us to which it would be suicidal to shut our eyes."

The Metal Trade Alliance.

At a special meeting of employers and workmen engaged in the metal trades of Birmingham and district, held this week, it was decided to terminate the alliance which has existed for the past five years. Between 4000 and 5000 men are affected. The 5 per cent. bonus will be discussed at a later meeting. Thus terminates one of the most interesting experiments in trade association which we have had in this country. In some comments upon association work which I made at the Cleveland convention I pointed out the danger there is of these associations breaking up in the face of a falling market. This is precisely what has happened now in the case of the Metal Trades Alliance, and we may expect in consequence some indiscriminate cutting of prices.

AGRICULTURAL IMPLEMENTS IN ARGENTINE REPUBLIC.

JOHN DUNN, SON & CO., 66 Beaver street, New York, advise us that they have just received a cable from Buenos Ayres stating that John & Joseph Drysdale & Co. of that city dispatched on November 29 for Tres Arroyos, about 300 or 400 miles south of Buenos Ayres, a special train consisting of 65 cars of Agricultural Machinery. This train carried exclusively implements manufactured in the United States and is referred to as the "biggest thing ever heard of in the Argentine Republic." The shipment comprised machinery manufactured by the Acme Harvester Company, Peoria, Ill.; the Walter A. Wood Mowing & Reaping Machine Company, Hoosick Falls, N. Y., and the Advance Thresher Company, Battle Creek, Mich.

AUSTRALIAN LETTER.

FROM OUR SPECIAL CORRESPONDENT.

SINCE last advice business has been still in a somewhat confused state, as the various Federal duties are scarcely understood as yet, and merchants have not settled down to the new prices.

The discussion in committee on the various items of the tariff, when no doubt many alterations will be made, makes the traders averse to buying freely, and a hand to mouth state of trade must be the order of the day for some little time yet.

One most satisfactory occurrence since last advice has been the visitation of an unusually generous rainfall throughout our whole belt of wheat bearing country. This has practically assured a fair harvest. If we are fortunate enough to get another visitation, even in a much smaller degree, within the next fortnight, a liberal harvest is assured.

Federal Tariff.

The cables will no doubt have informed you ere this of the Government victory over the want of confidence motion brought forward by the Opposition (free trade) party.

In a house of 74 the Government secured 44 votes, giving them a majority of 14 votes. This pretty well insures the protective policy of the country, and the tariff, particulars of which were sent you three weeks ago, will stand as a whole, although doubtless many amendments will be made in committee.

ITS NATIONAL ASPECT.

Viewed from the standpoint of an Australian Hardwareman, there is no doubt that the tariff is an excellent example of statesmanlike foresight. This country, extending from near the equator to about 50 degrees of south latitude, embraces every climate necessary to make it entirely self supporting. Rich in every known mineral, she has hitherto depended on outside sources for their supply, and any measure of protection which will enable her to develop her internal natural resources is to be welcomed. Every country in the world has at some period of its history had to fight for its existence, and Australia is not warranted in expecting that she will be the one solitary exception.

Great Britain may at any time be embroiled in a European war which may compel her to withdraw, for her own safety, her Australian squadron from these waters, and this small community, under present conditions, would then be left in a very hazardous state, with foreign war ships intercepting her commodities and necessaries of life. Therefore let us be protectionists, and, if our own individual wealth be not equal to developing our country's minerals, at least we can offer inducement to American and English capitalists to invest their money to our benefit, sure in their getting dividends by the barriers we raise on their behalf against the cheap labor countries of the Old World.

ECONOMICAL ASPECT.

Its economical aspect, so rigidly adhered to by free trade theorists, is entirely outweighed by the national requirement. It would doubtless obtain, for instance, in Great Britain, which country is entirely dependent on other nations for its food supply, being entirely unable to produce, by reason of situation, climate, &c., any decent proportion of the necessities of life, but here in Australia, as in America, we can grow everything, and in time we intend to make everything. But that time will not be of this generation, though it may be of this century.

This disquisition, though not strictly a Hardware letter, still has its bearing as indicating what this scribe believes to be the motive swaying Australians of the pres-

ent generation, having your country as an object lesson of success.

DIVISION OF TARIFF CUSTOMS.

The following table, officially prepared, will be of interest as showing the manner in which the Australian Commonwealth anticipates raising its revenue:

	1899. Net imports. Value.	Estimated total revenue, Federal tariff.
1. Stimulants	£1,620,222	£1,959,306
2. Narcotics	683,410	1,016,068
3. Sugar	219,067	127,660
4. Agricultural products, &c.	4,068,893	1,141,863
5. Apparel and Textiles	8,904,712	1,476,910
6. Metals	3,396,285	420,898
7. Oils, Paints, &c.	1,009,370	279,895
8. Earthenware, &c.	761,893	146,830
9. Drugs and Chemicals	756,639	115,257
10. Wood, Wicker and Cane	1,248,314	164,340
11. Jewelry and Fancy Goods	717,136	120,580
12. Leather and Rubber	754,917	119,775
13. Paper and Stationery	815,809	87,117
14. Vehicles	313,838	57,480
15. Musical Instruments	266,803	56,570
16. Miscellaneous	614,061	97,507
Totals	£26,151,369	£7,388,056

Adding the estimated revenue from excise, £1,554,345, the aggregate of £8,942,401 is arrived at.

It may safely be inferred that it will all be collected, and indeed a handsome surplus should be shown under the new system of calculation. Even where a duty is apparently reduced it is made to yield more revenue than formerly by adding cost of packing, freight, dock charges, entry and bill of lading charges and buyers' commission to the invoice, instead of, as formerly, collecting duty on factory cost of goods. In this case, therefore, a 20 per cent. duty often means 30 per cent. and even more. In one instance these charges ran up the duty on a parcel of furniture from 20 per cent. to 40 per cent.

ADMINISTRATION OF TARIFF.

The administration of the tariff bears somewhat severely at times, but this is, after all, not a very severe penalty to pay if it enables us to establish industries for local manufacture. In respect of many tools of trade which must be imported there is no doubt that the Legislature will revise the duties in committee.

CUSTOMS DECISIONS.

The customs authorities are beginning to levy duties on hard and fast lines. The imposition of duties will certainly suit the larger traders having ample capital to lay out on duties, and capital is certainly required in handing big lines. But even they are objecting to the interpretation of the Customs act (section 154, subsection A), which provides that the value for ad valorem duties "shall be taken to be the fair market value of the goods in the principal markets of the country whence the same were exported in the usual and ordinary commercial acceptation of the term, and free on board at the port of export in such country, and a further addition of 10 per cent. on such market value." The Victorian custom hitherto has been to pay duty on the actual amount of the purchase at the place of manufacture, but according to the above section the value for duty is not what is paid at the place of purchase, but at the port of dispatch.

Thus the customs authorities will now claim duty, for instance, on the purchase price of goods manufactured, say, in Ohio, plus charges to New York; or manufactured in Birmingham, plus charges to London. There appears to be no appeal against this, although the clause is much resented by traders.

N. E. I. DRAG NET.

These innocent looking letters, standing for "not elsewhere included," are introduced in the Federal tariff to the exclusion of the familiar "n. o. e.," not otherwise enumerated. N. E. I. acts as a splendid drag net for revenue, and covers an enormous range of goods previously duty free. They can scarcely be enumerated. Picking out the lighter lines of Hardware, with which your American exporters are concerned, it would be as well for those latter, in studying the tariff, to note, for instance,

CHAINS, such as Farmers' Plows and Trace Chains, Dog Chains, &c., now 25 per cent. ad valorem.

BRASS FOUNDRY.—All the lines covered by this comprehensive term, Handles, Hinges, &c., and with the exception of Escutcheons and Casters, all lines used in the manufacture of furniture.

BUILDING TRADE.—Almost everything, except Locks and Knobs.

HOUSEHOLD IRONMONGERY, including all Hollow Ware lines and Enameled Ware, which latter is so rapidly superseding Tinware, now 25 per cent.

RIFLES, GUNS, REVOLVERS, PISTOLS, formerly free, now 15 per cent.

LOADING TOOLS, formerly free, now 15 per cent.

PLAIN, GALVANIZED, PLATE AND SHEET IRON, 15 shillings a ton, formerly free.

CORRUGATED, 30 shillings a ton, formerly free.

TRACTION ENGINES, 15 per cent., formerly free.

BRADS, 3 shillings a hundredweight, formerly free.

TACKS, 3 shillings a hundredweight, formerly free.

SCREWS, 25 per cent., formerly free.

SPORTING POWDER, 1 penny per pound, formerly free.

And so on *ad infinitum*, so that it behooves American merchants to study the items carefully in making out lists for this market.

SYDNEY'S ADVANTAGE.

Sydney (N. S. W.) merchants at present have a strong advantage over their Melbourne competitors, inasmuch as having imported largely in their free trade city prior to the imposition of the tariff, they can now distribute their duty free goods throughout New South Wales so much cheaper than Melbourne houses, who by re-exporting to that State would have to pay Commonwealth duties. This state of affairs will right itself in time, but meanwhile Sydney has the best of it.

WEST AUSTRALIA.

The Westralian Government is enforcing the tariff duties in a distinctly Westralian fashion, in accordance with its constitution.

Where a duty under the new tariff is higher than under the old Westralian tariff the new duty is imposed, but when the new duty is lower the old duty is collected. Westralian merchants, therefore, seek to overcome the difficulty by selling at duty paid prices, subject to refund (if any) on the final tariff adjustment.

COACH BUILDERS' IRONMONGERY AND REQUISITES.

Since America does a fair export trade in the above with this country the following list of duty free articles under the new tariff will be of special interest:

Bar Iron and Steel (until proclamation only), Buckram, Machine Tools used in metal and wood working, Chain in the piece, Eyelets, Leaf and Foil, Locks, Door Knobs, Keys and Escutcheons, Pins, Gimp, Augers and Auger Bits, Ratchet Braces, Chisels, Gouges, Clamps, Bolt Cutters, Drills, Files and Rasps, Planes, Punches, Rules, Saw Sets, Snips, Spoke Shaves, Spoke Trimmers, Stocks and Dies, and Taps for same, Vises, Screw Wrenches, Washers and Rivets, Lenses, Unmounted Glass.

Minor articles for furniture, buttons, gimp, lace, tufts and fringes; undressed ash, hickory, oak and walnut; elm tubs, shafts and poles, undressed; rims of hickory in the rough, Emery and Flint Paper and Cloth; outside packages containing goods if such goods are free or subject only to fixed duties.

Cement.

The Australian market has always been held by English and local makers. It is a natural assumption that America does not depend on England for this commodity, but that she has her own limestone deposits. But America does not export any to this market, possibly because the home market claims all her attention. The London cost, f.o.b., is about 6 shillings per cask, and the new duty, 1 shilling per hundredweight, is, say, 3 shillings and 6 pence a cask. Freight and charges will be close on 4 shillings, making landed cost, say, 13 shillings and 6 pence. Have you an export trade, and could you meet English competition on the above basis?

Steel Rails.

New South Wales will shortly be again in the market for Steel Rails, 15,000 tons of which will be required as a first installment. Your makers will doubtless be on the watch at the Agent-General's office in London. Numerous syndicates for the manufacture of these from local Iron Ore deposits are continually being mentioned in the daily press, but nothing has actually materialized as yet.

Wire Netting.

"Br'er Rabbit," our national nuisance, has now got away westward nearly to Southern Cross, West Australia, and the Government of that State cannot delay much longer in calling for several hundred miles of Wire Netting, if the cultivated areas of the extreme west are to be saved. This is a duty free line.

Electric Lighting and Power.

Electric lighting and power is having increased attention throughout Australia, and there is a big field for developments in these lines. The General Electric Company of Schenectady are busy with the Sydney Tramway Service. Fifty thousand pounds has been placed on the estimates for a Melbourne to Sydney (580 miles) telephone.

Cycles and Lamps.

Cycle trade is decidedly dull and the Lamp season is over. Hanging Lamps will, judging by recent sales, be more in demand next season than hitherto, largely superseding standing Lamps.

Builders' Hardware.

Builders' Ironmongery is easing off and trade is not anticipated to be particularly brisk for the next month or two, although it will undoubtedly "come again" very briskly. The trade is well stocked.

Iron Industry.

A conference of Premiers of the different States was held Saturday, November 2, when the Federal Prime Minister put forward his suggestion that bonuses ranging up to 12 shillings a ton shall be granted on locally produced Iron. Before the bonus is granted a minimum quantity, to be specified later, must be produced, and the payment of bonuses will cease and a 10 per cent. import duty be levied after the production of a given quantity, to be specified later. The various Premiers are to consult their respective State Cabinets before the matter is proceeded further with.

Fire Extinguishing Appliances.

Australia is very deficient in her fire extinguishing appliances, municipal councils throughout the land appearing to take delight in keeping the grant to local fire brigades as low as possible. To good luck alone can be ascribed the comparative immunity from disastrous conflagrations in Melbourne and Sydney. In these cities the number of men and engines is absurdly small by comparison with the cities of America and Europe. There seem to be indications of a public awakening to the dangers we run, and your American makers of these goods are hereby invited to watch developments in this direction in the near future. Water towers, for instance, are badly needed. We do not possess one at present.

BRAUNSDORF-MUELLER COMPANY'S NEW CATALOGUE.

BRAUNSDORF-MUELLER COMPANY, Elizabeth, N. J., have just issued catalogue No. 3 of warranted Mechanics' Tools, to their line of which they are continually adding new goods, the catalogue just issued containing many such. Among the goods described are a new Magazine Brad Awl Handle, several new styles of Screw Drivers, of which eight patterns in all are made; Flush T Bevel, Knurling Tools in variety, Speed Indicators, Plumb Bobs, Awls, Lace Leather and Rod Cutters, Emery Wheel Dressers, Brace Wrenches, Carving Tools, Pin and Hand Vises, an assortment of Drills, Reamers, Screw Driver Bits, Countersinks, Punch Sets, Plasterers' Tools, Chisels and similar goods.

WHAT TO DO IN DECEMBER

BY H. C. W.

WHAT can we do in this, the crowning month of the year? Everything depends on the man back of the machine just now, as to whether it be one of the best and most profitable months of the year, or the slack be let in to the line and it be one of the poorest.

It has been an education of years to the average Hardware merchant that he persuade himself of the fact that holiday trade is for him as for others. The old time merchant absolutely ignored the putting in and selling of profitable specialties for holidays, and there are still a few, scattered here and there, who yet abide in the old faith.

Twenty years have changed all methods of business. We have with us now the racket store, the department house, the variety shop, the 5 and 10 cent store—each and every one of them drawing largely for their stocks from the Hardware catalogues; and drawing to our great loss throughout the 12 months of the year. Why should not the Hardwareman take this one month of the 12 to recoup in part at least for the losses of the others?

A Showing for Profit

can always be made for the month. Let the stock be legitimate as nearly as possible, and avoid if you will the marble and jewsharp and jackstone part of it. Let it be well selected, up to date, clean and bright, and consist of Skates and Sleds, Wagons and Velocipedes, Pocket Knives, Scissors and Shears, Plated Knives, Forks and Spoons, Baking and Chafing Dishes, Coffee and Tea Pots, Razors, Strops and Brushes, Manicure Sets, Carving Knives and Forks, Bread and Cake Knives and hundreds of other lines of which holiday goods may be made. There will be no sacrifice of the dignity of the business—as many seem to feel is the case—even if only these splendid lines are adhered to and well gotten ready.

December Decides Many Things,

as it is the closing month—so must it also be closely allied to the opening. For most of us the year ends with it, and for some of us there will be changes in firm, in location, in incorporation, or in method of conducting the business, and the month must be finished ready to make any of these changes that may come up. Changes in books usually occur the first of the year, and the closing of the month must see us ready for the change. And this, of course, necessitates closer and better collections than at any other season of the year. Whether or not these changes do occur, the books, the business, the stock, should be in just such condition at the closing of December as to enable next year's start to be made without a hitch. It takes much work through the month to accomplish this, but no class of work is so profitable as this with the end in view.

Taking Inventory

the first of the year means much hard work in December—along with all else—in the getting ready for it, and the getting ready is half the taking of it. It will not do, of course, to let this interfere with the splendid holiday business you should have—and it need not. The preparatory work can be done nicely in the last five or six days of the month, following the Christmas trade.

It is the writer's experience that the real work of stock taking can be cut in two, both as to the labor and the time usually occupied; and two or three good boys in the house can do the "getting ready" part nicely in the few days allotted. All bins should be counted or weighed and stock ticket thrown in. Floor and Table Oilcloths measured and marked with pencil or chalk; Rubber and Leather Belting the same; the Glass bins cleaned up and contents marked, and so on through the house, wherever possible to count ahead, or where full packages or broken stock can be enumerated and tagged.

This last few days' work of December is one of the most satisfactory things in the business, and is done at a time when men can be best spared for it.

Window Work in December

is a trial to any but the man who realizes the very many changes that should be made in the month. It is a great mistake to make elaborate set window pieces for holidays. Much time, much labor is given them, so much that you or your men want them to stand much longer than they should, and just about the time an elaborate one is finished some one will want the center piece—probably the only one you have—and the work is spoiled in a manner. What I am trying to get at is this—more, much more, attention should be given to frequent cleansing and frequent changing in December than to anything else. You have so much that is beautiful, and the only way to show it all correctly is to add and take from the windows each day, or you will crowd them. Then this plan leaves the goods in the window so easy to get at—and handsome holiday goods show of themselves—as does a beautiful picture, without much in the way of elaborate framing.

December Outlook and 1902.

Perhaps there has not been a December in years that offers such an outlook for the month, and for the new year to come, as this. The wave of prosperity gives no indication of rolling backward; practically no failures are recorded among the Hardware trade; in spite of trusts, combinations and some predictions, prosperity seems to grow on all sides. The results of the month and the year should be productive of fewer changes, because of unsatisfactory business, than have been recorded for very many years past. Men are satisfied—employer and employees—prices are not excessive: wages are on a better basis than many of us can remember heretofore; and taken altogether, the month gives indication for the new year to follow as being one of the greatest we have ever known in business.

DESTRUCTION OF ONE OF THE NATIONAL ENAMELING & STAMPING COMPANY'S PLANTS.

THE fire on the night of the 27th ult. which totally destroyed the entire plant of the National Enameling & Stamping Company, located on the site bounded by Metropolitan, Bedford and Driggs avenues and North First street, Brooklyn, N. Y., will not embarrass the company in executing orders for goods. The trade sending in orders the day after Thanksgiving were not delayed 24 hours in shipments, we are advised, owing to the proximity of their two plants, one on North Third street, nearby, and the Berlin Works at Laurel Hill, Long Island, a suburb of Brooklyn, aside from other comparatively nearby factories at Portland, Conn., and Baltimore, Md., from which to draw. The destruction was total, the loss, however, being fully covered by insurance. How the fire occurred is not known, the gray haired watchman, with his lantern over his arm and accompanied by his dog, being found in the ruins burned so as to be almost unrecognizable. Whether or not the works will be rebuilt on the old site has not been determined.

HARTMAN MFG. COMPANY.

IN the United States Circuit Court at Pittsburgh last week, Stuart H. Patterson of New Jersey filed a bill in equity against the Hartman Mfg. Company, operating Rod, Wire and Nail mills at New Castle, Pa., asking that a receiver be appointed for the concern. The petition was granted and the Union Trust Company of Pittsburgh was appointed to the position. F. A. Umsted, president, and William L. Kiefer, secretary and general sales agent of the Hartman Mfg. Company, filed an answer admitting the allegations. The court made a decree finding the company insolvent and directing the receiver to continue business and purchase necessary materials to complete the contracts now in progress.

The Hartman Mfg. Company were organized some years ago by Henry W. Hartman, but he has not been connected with the company for several years. They originally operated a plant in Ellwood City, Pa., in the manufacture of Wire Rods, Wire Nails, Wire and Fencing, and in the past year or two the capacity of the plant was considerably increased. A few months since the company decided to remove from Ellwood City to New Castle, Pa., and purchased a large building formerly occupied by the New Castle Tube Company. Wire Nail machines and other equipment were being installed in this plant, and it was the intention of the Hartman Mfg. Company to very much enlarge the capacity they had at Ellwood City.

About a month ago the company bought the plant of the Cuyahoga Steel & Wire Company, at Cuyahoga Falls, Ohio, and the fact that the entire purchase money was not paid may possibly lead to considerable litigation. It is understood that the direct cause of the embarrassment of the Hartman Mfg. Company was the fact that the company were doing a very large business on a moderate capital, and, becoming involved to a considerable amount, some of the creditors became alarmed and asked that a receiver be appointed, which was done. The two officials named above are quoted as saying that the company will pay their obligations in full.

THE KNAPP & SPENCER COMPANY.

THE KNAPP & SPENCER COMPANY, wholesale Hardware merchants of Sioux City, Iowa, are distributing among their trade a want book containing in the neighborhood of 150 pages. It has a tinted paper cover printed in colors, while the pages are of a quality suitable for the use of pen and ink. At the head of each page are two or more lines, some of which call attention to special brands of goods handled by the company. The suggestions regarding the purchase of goods follow to some extent the seasons in which they are salable. Interspersed with the references to goods are business maxims, among which are the following:

When you have a novelty, tell people about it before it is sold.

Doing little duties carefully fits you for doing larger duties well.

Wiser competition would assure more certain and rapid success.

Don't neglect to take an annual invoice; all prudent merchants want to know exactly where they stand.

Don't trust a man with your goods to whom you would not make a cash loan.

The company make it a point to let it be known that they sell to the retail trade only, and that inquiries or orders from consumers will be referred to the nearest dealer. Soon after January the company expect to be located in their new warehouse building, which has been under construction during the past year. It consists of seven stories and basement, each 100 x 150 feet, giving 105,000 square feet of floor space, which is almost three times as much as they have heretofore had. This, with modern improvements, gives facilities for handling a greater volume of business.

TRADE ITEMS.

STANDARD HORSE SHOE COMPANY, South Wareham, Mass., expect to start up their works early in January, 1902. This plant, which is well equipped for the production of Horseshoes, has been idle for some time past. Recently, however, repairs have been made on furnaces and machinery, and the plant is now in condition for starting up. It has a capacity of 200 kegs of finished Shoes per day.

THE CHICAGO STEEL MFG. COMPANY, formerly the Collier Shovel & Stamping Company, Washington, Ind., manufacturers of Shovels, Spades, &c., on Monday, December 2, started up their new plant at Hammond, Ind., where their principal offices are now located and where in the future all communications should be addressed. With their increased and improved facilities it is their intention to turn out a higher grade of product and more promptly than ever. They are represented in the East by Allerton-Clarke Company, 97 Chambers street, New York.

Iowa Cutlery Works, Cedar Rapids, Iowa, successors to the Lang Cutlery Works, have recently elected the following officers: Z. L. Brewer, president; W. A. Hubbard, vice-president; R. A. Kurtz, secretary and treasurer; the foregoing persons, with E. D. Arbingast and H. M. Hunter, directors. The company are making some improvements in their factory, with a view to greatly increasing their facilities for turning out work.

DISPENSING WITH RECEIPTS FOR REMITTANCES.

THE past year has developed a change in the business routine of some of the large Hardware jobbing houses, by means of which an economy is effected. The reform in question is the giving up of sending receipts for remittances, in view of the fact that the check or draft is a sufficient voucher. In this way a saving in labor is effected, as well as in postage. This reform was put into operation last summer by prominent Western jobbing houses, and is now being taken up by others. It is generally referred to as working satisfactorily and occasioning very little friction in trade. The reasons for this action are thus given in a notice which was sent out to the customers of the house issuing it:

Beginning July 1 we will discontinue sending receipts for remittances, except those made in currency.

In explanation of the above would state that our object in so doing is to avoid what we consider an unnecessary labor and expense. For some years past we have been making our remittances without requiring acknowledgments of same, as we consider an indorsed draft answers all purposes of a receipt, and in case of a money order, or express money order being sent, the proof is in your town.

Remittances at all times should be made, if possible, by bank draft, express money order or post office order. Currency should never be sent if avoidable, and in case it is sent, it should invariably be by registered letter.

This action is in line with the tendency of the times. The plan is being adopted rapidly by many large concerns, and we believe it will soon be a very general custom, simply because it is in the line of economy and saving in which all will naturally share, and in which, therefore, all are equally interested.

Norvell-Shapleigh Hardware Company, St. Louis, go into the matter more fully and explain the reasons for their action in the following announcement:

Beginning August 1 we will discontinue sending receipts for remittances, except when made in currency.

This plan is being adopted very generally throughout the mercantile world, for the reason that it is in the line of economy and saving, in which, as all will share, all should be equally interested.

As the ordinary forms of remittances are in themselves their own best receipts, the sending of acknowledgment by the house receiving them is unnecessary, and is, therefore, "waste." Modern business methods are largely in the direction of preventing waste.

As far as possible all remittances should be made in one of three ways: Bank draft, express money order or post office money order. Records show that not one remittance out of 10,000 goes astray, and in the few cases where they do fail to reach their destination, if it is in one of the above forms, the proof of its having been sent is in your own town.

If you send us a draft, we have to indorse it before it will be accepted by our bank; our bank has to indorse it before it will be accepted back by the bank in your town and, therefore, this draft carries on its back the entire history of the transaction. If any question should arise about it, your bank will gladly furnish the necessary information. In the case of express and post office money orders, you not only get a receipt from the office, but that office can trace the money order through for you and show payment if desired.

We shall, of course, continue acknowledging the receipt of all remittances made in currency, whether registered or not.

The fact that receipts are not necessary has for a long time been recognized by business men, and many commercial houses have for years been refraining from asking them. The present reform is, however, a step in advance, as the trade are given to understand that receipts will not under ordinary circumstances be sent unless specially requested. The announcement made in regard to this matter by W. B. Belknap & Co., Louisville, Ky., will be of interest in this connection:

Customers will please note that, in accordance with a growing custom which readily recommends itself to business men, we will send receipts for remittances only when such are especially requested.

We have tried for the past ten years ourselves the plan of not asking for receipts; on the contrary, where we send checks we ask that no acknowledgment be made, and have yet the first case of complication to arise therefrom. In the light of this experience, we ask our friends to permit us to do away with this needless expense and multiplication of papers which all of us wish to avoid.

We have no remittances to speak of in currency, and as checks, drafts and express money orders are always returned to the sending point after being paid and canceled, you have at your hand all the necessary proof of payment, should question arise.

So little store is set by the old form receipt, that our ingenuity is taxed to put it in such form as will save it from the waste paper basket. Of course, special forms, vouchers, settlements by trustees and administrators, &c., will be acknowledged in the usual formal way, as will the remittances of such customers who particularly desire it.

The W. Bingham Company, Cleveland, Ohio, who have recently announced their adoption of the same policy, thus explain the matter to their customers:

No receipts for remittances by check will be sent by us after December 1, 1901, except on request. Checks bearing our indorsement are sufficient receipts.

Vouchers and special forms with remittances will be interpreted as a request for a receipt.

We adopt this plan following a fast growing custom with business houses who find that it works admirably, and saves much labor.

There seems to be little doubt that this movement will still further extend itself throughout the trade, in view of its advantage as diminishing the labor and expense of doing business.

PRICE-LISTS, CIRCULARS, &c.

Cutaway Harrow Company, Higganum, Conn.: Catalogue describing their line of Clark's Cutaway Harrows, Plows and Weeders, Clark's Wine and Cider Mills, Clark's Root Cutter, Dutton Mower Knife Grinder, Cutaway Rice Plow, Double Action Cutaway Harrow, &c.

F. E. Chester & Co., 3 Pine street, Providence, R. I.: Catalogue of Furnished Fish Lines and Fishing Tackle assortments. The manufacturers call attention to several novelties which they have added to their line this year.

The Turner Brass Works, Chicago, Ill.: Circulars describing the Turner Vapor Lamp, and giving *fac-simile* testimonials from parties in different sections of the country who have used the Lamps with satisfaction. One of the circulars presents a view of the company's new factory building, with its 56,000 square feet of floor space.

Cosmopolitan Incandescent Gas Light Company, 176 Madison street, Chicago: Illustrated net price-list of a few of their staples, such as Mantles, Burners, Chimneys, Clusters, Outdoor Globes and Lamps, fancy hanging Lamp, Mica Canopies, Portables, &c. If interested in fany Portables, fancy or colored Glassware and miscellaneous goods, they request the trade to send for their catalogue No. 4.

The Iowa Farming Tool Company, Fort Madison, Iowa: Circular relating to their walk cleaning Tools, illustrating their Star Socket and Shank Cleaners, Iowa Ice Chisel and Walk and Street Scraper.

Baldwin Refrigerator Company, Burlington, Vt.: Catalogue showing the Baldwin line of Refrigerators for 1902. The company state that they manufacture about 140 styles and sizes in hard wood and soft wood, metal, porcelain and spruce lined.

AMONG THE HARDWARE TRADE.

W. C. Cameron has admitted a partner in his Hardware business in Danbury, Iowa, and the firm style is now Cameron & Sigmon. A new building for the business, 25 x 100 feet, two stories and basement, brick, is in course of erection.

Devaney & Son are a new firm in Cascade, Iowa, carrying a line embracing Shelf and Heavy Hardware, Tinware, Sporting Goods, &c. They make a specialty of Furnace work and plumbing.

E. T. Smith Hardware & Furniture Company, Arcadia, Fla., have lately incorporated with a capital stock of $50,000, to carry on the wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, furniture, &c. The company have recently completed quite a large addition to their former establishment.

U. S. Jarrett has bought the General Hardware stock formerly owned by L. A. Beckwith at St. Albans, W. Va.

An effort is being made to consolidate some of the leading Hardware stores in Homestead, Pa., a few miles from Pittsburgh, where the famous Homestead Steel Works of the Carnegie Company are located. If the deal goes through the consolidated company will be known as the Homestead Hardware Company. The stock of Baker & Oskin has already been purchased and it is said options have been secured on a number of other Hardware stores.

Laib Company, dealers in Mill, Factory, Steam and Plumbers' Supplies, Louisville, Ky., are about to move to more spacious quarters, where they will be in a better position to serve their customers than heretofore. After January 1 they will be located in their new store, 439 West Main street, which extends through an L to 153 Fifth street, the latter premises being used for shipping purposes. The company have just issued a 450-page catalogue, illustrating their full line of goods.

The Hartman Hardware Company, McKeesport, Pa., have been chartered with a capital of $75,000.

The Fitler & Todd Company, Pittsburgh, Pa., have been chartered with a nominal capital of $4000. The new concern will take over the present business of Somers, Fitler & Clark, Limited, dealers in Mill Supplies.

Hines & Vopalensky is the style of a new Hardware firm at Morse Bluff, Neb. They are dealers in Shelf and Heavy Hardware, Stoves, Tinware and Sporting Goods, of which a good stock is carried.

Mitchell & Trimble have recently engaged in business in Apache, O. T., handling Shelf Hardware, Tinware, Stoves, Farm Implements, Harness, &c. They occupy a building 24 x 80 feet and have a warehouse, 24 x 40 feet, in course of erection.

John Hughes, Gretna, Neb., has disposed of his Hardware line, but continues in the Harness and Agricultural Implement business.

Hibbard Hardware Company have succeeded C. B. Cruwell & Co., in the Hardware, Stove, Tinware and Sporting Goods business in Oskaloosa, Iowa. The new firm have made a number of improvements in the establishment, including new front and shelving.

S. B. Colvin has succeeded Colvin & Mechling, dealers in Hardware, Stoves, Farm Implements, &c., Mt. Pleasant, Pa.

Lockwood & Palmer, Stamford, Conn., are erecting a modern three-story brick and iron building, 66½ x 85 feet, all of which they will devote to their business of Hardware, Stoves, and House Furnishing Goods. The building will be up to date in all its appointments, and they expect to take possession about January 1.

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A SWINDLER IN THE WEST.

A FEW weeks ago a suave individual called upon two manufacturing concerns in Chicago, representing himself as George Tritch of the Geo. Tritch Hardware Company, Denver, Col. Leaving a good round order he had no trouble in securing a raise in cash from each house. That the swindler is still operating is evident from two letters received last week from manufacturers outside Chicago, who relate the same experience as their Chicago brethren. The George Tritch Hardware Company wish to do everything possible to prevent their friends from being victimized in this manner, and hope that the publication of the facts will put others on their guard, and perhaps, if the impostor continues his work, lead to his arrest and punishment.

FLINT & WALLING MFG. COMPANY'S CATALOGUE.

FLINT & WALLING MFG. COMPANY, Kendallville, Ind., have just issued general catalogue No. 42, which illustrates and describes their line of Star Windmills, Hoosier and Fast Mail Pumps and Auxiliary Goods. The catalogue contains nearly 250 pages, is attractively printed and bound, and presents satisfactorily the extensive line to which it is devoted. In the early pages the growth of the company's business is impressively indicated.

BERKELEY SPRINGS SHOVEL, STAMPING & TOOL COMPANY.

THE BERKELEY SPRINGS SHOVEL, STAMPING & TOOL COMPANY have been organized at Berkeley Springs, W. Va., with a capital of $25,000. George W. Biser is president and Frank Forsythe of Wheeling is master mechanic and machinist. It is stated that plans for a new plant to be built by this company have been completed.

MISCELLANEOUS NOTES.

The Standard Fire Extinguisher.

E. B. Badger & Sons Company, Boston, Mass., who are sole manufacturers and patentees of the Badger standard automatic chemical fire extinguisher, recently put on the market, issue a pamphlet describing the construction and operation of the extinguisher, which, they state, is approved by the New England Board of Fire Underwriters. The Standard extinguisher is constructed of extra heavy cold rolled copper thoroughly coated on the inside with a lead lining, making it, it is stated, absolutely acid proof and free from corrosion. The seam is double lock jointed and reinforced on the inside with a heavy strip of copper thoroughly sweated together and soldered, making a smooth, strong joint. The acid bottle is held in a cage firmly attached to the neck of the machine and is easily moved from its position by simply lifting it out of the cage. Special attention is called to the new stopper attachment, which is permanently secured to the top. The machine has a regulated feed so that it can be inverted a number of times without recharging and a chemical action obtained each time. The hose is detachable by a swedge coupling, which is referred to as a great improvement over the old method.

Tin Plated Spoons and Forks.

M. S. Benedict Mfg. Company, East Syracuse, N. Y., manufacturers of silver plated ware and metal goods, expect soon after the first of the year to put on the market under their own name a full and complete line of double tin plated steel spoons and forks. A special effort will be made to sell these goods through the hardware trade.

Thumb Tacks in Cartons.

The Hawkes-Jackson Company, 82 Duane street, New York, are offering a thumb tack for draftsmen, artists, &c., of a somewhat different construction and more moderate price than others now on the market. These are made in 21 different styles and sizes, with round steel points, having both brass and German silver heads, with flat or beveled tops, the heads ranging in diameter from 6-16 to 11-16 inch, increasing by sixteenths. These goods are attractively put up in compartment boxes, as here

Draftsmen's Thumb Tacks in Containers.

shown, the assortment containing 90 dozen of the various kinds for the retail trade in an attractive, convenient and economical form for display as well as handling. These tacks are said by the manufacturers not to break, or injure the thumb. The tacks, on squares of wood, handsomely labeled, are six deep in each compartment.

Becker's Rubber Bucket for Chain Pumps.

The accompanying cuts represent rubber buckets for chain pumps, offered by C. L. Becker, Keokuk, Iowa. As shown in Fig. 2 the metal portion of the bucket consists of two parts, which can be opened or closed. These

Fig. 1.—Becker's Rubber Bucket for Chain Pumps.

buckets, it is explained, can be hooked into or removed from the chain link at pleasure, without the use of tools and without injury to the chain. The advantage claimed for this bucket is that the chain links do not have to be

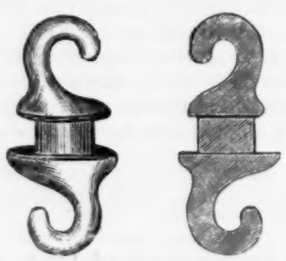


Fig. 2.—Metal Parts of Becker's Rubber Bucket.

opened in order to insert the bucket, and that there is, therefore, no danger of weakening or breaking the links of the chain.

The Tennessee Hand Grinding Mill.

A. H. Patch, Clarksville, Tenn., is offering the hand grinding mill shown herewith. All bearings are chilled and the crank is of malleable iron. The grinding plates are made, it is remarked, of the hardest and strongest

Fig. 1.—The Tennessee Hand Grinding Mill, Front View.

metals. The mill is designed for farm or family use, and is readily taken apart for cleaning or oiling, without the use of tools. New grinding plates can be inserted at a small expense, it is remarked, whenever the original ones are worn out. The mill is adjustable for fine or

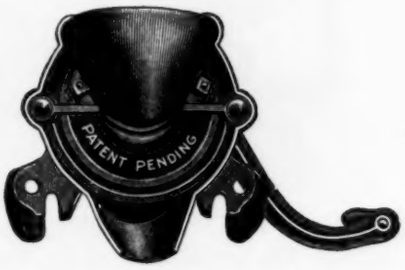
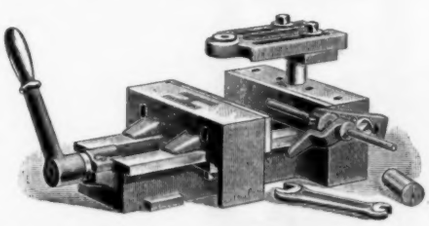


Fig. 2.—The Tennessee Hand Grinding Mill, Rear View.

coarse grinding of wheat, corn, rye or other dry grain. The mill weighs 12 pounds complete.

The Universal Jig Vise for Drills.

The accompanying cut represents a drill vise, manufactured by the Graham Mfg. Company, Providence, R. I., and also by the Imperial Vise Company, Galt, Ontario, Canada. The cut shows the vise with universal attachments. The vise is principally intended for use in quickly securing work in the desired position for drilling, and as rapidly releasing it after the job is done. This is an important feature, as it has been observed by the manufacturers that more time is usually consumed in securing work in the ordinary way than in drilling the holes. With the vise illustrated the piece to be drilled is placed between the jaws and gripped



The Universal Jig Vise for Drills.

in the desired position. The vise is slid under the drill and the work proceeded with. It is explained that there is no need of bolting the vise to the table, as no tilting occurs with the vise, as is the case with the angle plate. By the use of the vise it is shown that a material saving of time will be effected, also that by having a convenient means of securing work, drills and taps—when tapping is done by the drilling machine—will not be so often broken. The jig attachments are extra, but go with every vise, and are intended for duplicate drilling, to save the time and trouble of laying out work, and to prevent the drill creeping to either side. It is explained that the way to use the jig is to lay out and drill one piece, paint the same some unusual color to be kept as a sample or template by which to set up the jig when similar pieces are again to be drilled. One specially designed feature of the attachments is the means for drilling holes through the center of a shaft or spindle, or as much out of center as desired, and to do it accurately and quickly. The manufacturers believe that a drill hand would use one of these vises as many hours in the day as a bench hand would use a bench vise. The point is made that if drills are equipped with these vises the innumerable blocks that usually heap up for use on the machine may be dispensed with. The jaws of the vise are faced with unannealed steel, and everything about the vise and attachments, it is stated, is designed so that all changes can be made in the shortest possible time. The vises are made in three sizes, with jaws 6, 9 and 12 inches long, and weight 32, 65 and 135 pounds each.

Phœnix Cork Pullers.

The Arcade Mfg. Company, Freeport, Ill., are offering the cork pullers herewith shown. In Fig. 1 the puller is illustrated with bottle holder and in Fig 2 without

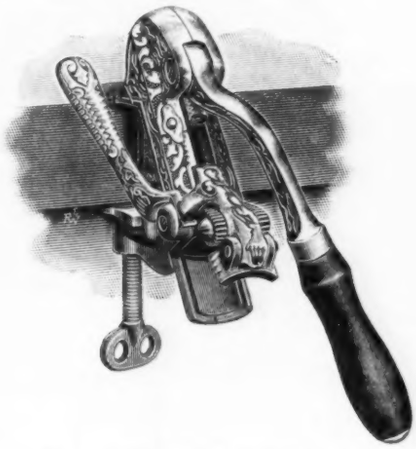


Fig. 1.—Phœnix Cork Puller No. 60.

the bottle holder. The lever is represented as being down at the side of the bar, as when not in use. The pullers are referred to as being so simple that any one

Fig. 2.—Phœnix Cork Puller No. 30.

can operate them. They are provided with a positive nut lift to insure the drawing of soft as well as hard corks. The pullers are full nickel plated with black enameled handles.

C. J. Chastain and W. E. Chastain, under the style of Chastain Hardware Company, have lately embarked in business in Cleo, Oklahoma, handling Shelf Hardware, Stoves and Tinware, Sporting Goods, &c. They are occupying a new building which has lately been completed.

The Star Cross Cut Saw Handle.

The accompanying cuts relate to a cross cut saw handle, offered by W. C. Duttlinger & Co., Memphis, Tenn. In Fig. 1 the several parts of the handle are shown, also the handle assembled. The handle is illustrated in Fig. 2 attached to the saw. The wooden part

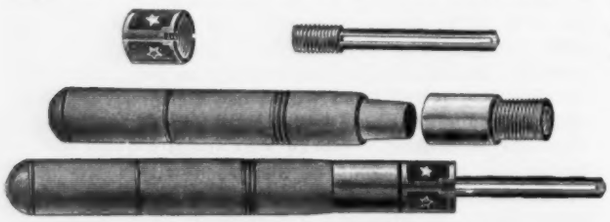


Fig. 1.—The Star Cross Cut Saw Handle.

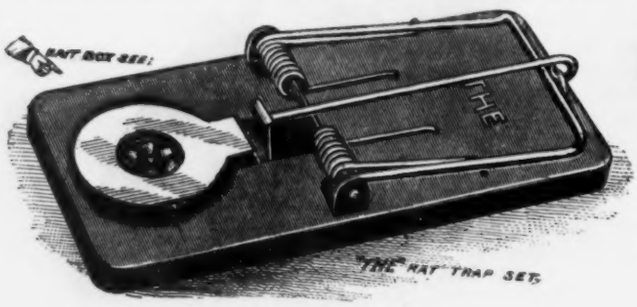
of the handle is solid, not bored, while the metal parts are of malleable iron. The special feature of the handle is two deep cut right and left hand threads, one thread working against the other, so that where one thread works up the other works down, both at the same time. This arrangement is designed to allow the handle to be

Fig. 2.—The Star Handle Attached to Saw.

put on or taken off the saw quickly and to prevent the handle working loose from the saw. The handle is referred to as strong and durable, and as one that will stand hard usage and not break.

"The" Rat Trap.

J. K. Osborn Mfg. Company, Harrison, N. J., for whom John H. Graham & Co., 113 Chambers street, New



"The" Rat Trap.

York, are selling agents, have just brought out "The" rat trap here illustrated, which in its general character resembles the mouse trap previously introduced. The base is stamped from sheet steel, gray enameled, and is 3½ x 7 inches in dimensions. The bait box is a concavity for holding the bait beneath the movable pedal, so that the animal must spring the trap in getting at the bait. The coil springs and square loop are of strong coppered steel wire. The traps are packed 12 in a pasteboard box, and 12 boxes, or one gross traps, in a case.

The Defiance Cold Blast Lantern.

The Defiance Lantern & Stamping Company, Rochester, N. Y., are offering the lantern shown herewith. In Fig. 1 it is represented with the bail holding up the

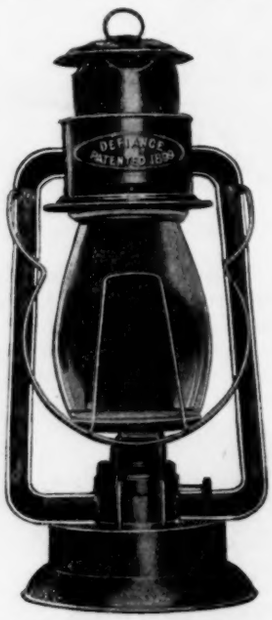


Fig. 1.—Defiance Cold Blast Lantern.

globe for lighting. The arrangement of the hinge and the fluted globe plate are shown in Fig. 2. The globe may be turned back to trim the wick, or the globe removed for cleaning. Thus the patent combination lift and hinge globe exposes the burner in two ways for lighting. The fluted globe plate, shown by the smaller cut in Fig. 2, is referred to as being so constructed as to

Fig. 2.—Hinged Feature and Fluted Globe Plate.

throw the cold air directly against the globe, keeping the latter cool and less liable to be broken, and preventing the flame flickering. The lantern, it is remarked, gives a bright, steady light, and is guaranteed by the company to be absolutely wind proof. They also make Nos. 0 and 2 Rochester lanterns, also in dash patterns.

Current Hardware Prices.

REVISED DECEMBER 3, 1901.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓&10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Cut Prices.—*In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.*

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (April 4, 1901), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, ₩ doz. $3.00....33⅓@33⅓&10%
North's.....10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent.....25&5%
Taplin's Perfection.....50%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Armand Hammer, Wrought ₩ lb 8½@8¾c
Buel Patent, Trenton.....₩ lb 9½@9¾c
Eagle Anvils.....₩ lb 7¾@7¾c
Hay-Budden, Wrought.....9c@9½c
Horseshoe brand, Wrought.....9c@9½c

Imported—

Peter Wright's.....9½@9½c

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....20%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz.....25%
Smaller Lots.....20%
Lots of 3 doz.....30%

Augers and Bits—

Com. Double Spur.....70@70&10%
Boring Machine Augers,
60&10&10@70&10%
Car Bits, 12-in. twist.....60@60&10%
Jennings' Pattern
Auger Bits.....50&10&5@60%
Ford's Auger and Car Bits.....40&10%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list....40%
No. 30. R. Jennings' List.....50%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits 15&10@15&10&2½%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....50&10%
Snell's Car Bits, 12-in. twist.....60%
Wright's Jennings Bits (R. Jennings' list).....50%

Bit Stock Drills—

Standard List.....65@65&5%

Expansive Bits—

Clark's small, $15; large, $26.....50&10%
Lavigne's Clark's Pattern, No. 1, ₩ doz., $26; No. 2, $18.....50&10%
C. E. Jennings & Co., Steer's Pat.....33⅓%
Swan's.....60%

Gimlet Bits—

Common Double Cut..gro. $2.25@2.75
German Pattern.....gro. $3.25@4.50

Hollow Augers—

Bonney Pattern, per doz. $11.00@11.50
Ames.....25&10%
New Patent.....25&10%
Universal.....20%
Wood's Universal.....25%

Ship Augers and Bits—

Ford's.....40%
Snell's.....40%
C. E. Jennings & Co.:
L'Hommedieu's.....15&10%
Watrous'.....40%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled.....gro. $2.75@3.10
Unhandled, Shouldered..gro. 65@65c
Unhandled, Patent.....gro. 68@70c
Peg Awls:
Unhandled, Patent....gro. 31@34c
Unhandled, Shouldered..gro. 65@70c
Scratch Awls:
Handled, Common..gro. $3.50@4.00
Handled, Socket..gro. $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality, best brands, $5.50@5.75
First Quality, other brands $5.25@5.50
Jobbers' Special Brands:
Good Quality.....$4.50@4.75
Best Quality.....$5.00@5.25
Cheap, Handled Axes.....$5.50@5.75
Beveled, add 25c doz.

Axle Grease—See *Grease, Axle.*

Axles—

Iron or Steel.
Concord, Loose Collar.....4½@5c
Concord, Solid Collar.....4¾@5¼c
No. 1 Common.....3½@3¾c
No. 1¼ Com. New Style..3¼@4 c
No. 2, Solid Collar.....4¼@4½c
Nos. 11 to 14.....70@70&10%
Nos. 15 to 18.....75@75&10%
Nos. 19 to 22.....75@75&10%

5% cash 10 days.

Boxes, Axle—

Common and Concord, not turned..
lb. 4½@4½c
Common and Concord, turned.....
lb. 4¾@5c
Half Patent.....lb. 8@9c

Balances—

Caldwell new list.....50%
Pullman's.....60%

Sash—Spring—

Spring Balances....50&10@50&10&5%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%
Peerless.....50%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb., per lb..
2¾@3c

Beams, Scale—

Scale Beams, List Jan. 12, '85.40&10%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters—Egg—

	₩ gro.
Standard Co.:	
No. 5 Steel Handle Dover	$6.50
No. 10 Cast Handle Dover	$8.00
No. 10 Steel Handle Dover	$8.00
No. 15 Ex. Hy. Steel Rd.	$15.00
Rival	$1.00
Taplin Mfg. Co.:	₩ g o.
No. 60 Improved Dover	30 50
No. 75 Improved Dover	7.50
No. 75-2 Imp'd Dover, Tin'd	8.00
No. 100 Improved Dover	8.00
No. 102 Improved Dover, Tin'd	9 50
No. 150 Improved Dover, Hotel	$15 00
No. 152 Imp'd Dover, Hotel, T'd	8 7.00
Lyon's, Standard sizes	₩ doz. $1.75
Wonder (S. S. & Co.)	₩ gro. $7.50

Bellows—

Blacksmith, Standard List.70@70&10%
C. E. Jennings & Co., Blacksmith..60&10%
C. E. Jennings & Co., Hand.....33⅓%

Blacksmiths—

Inch..	*3*	*32*	*34*	*36*	*38*	*40*
Each	*$3.50*	*3.75*	*4.25*	*4.80*	*5.35*	*6.15*

Extra Length:

Each	*$4.00*	*4.55*	*5.10*	*5.60*	*6.40*	*7.50*

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*	*16*
Doz	*$6.75*	*7.25*	*8.50*	*9.50*	*12.00*	*14.50*

Hand—

Inch...	*6*	*7*	*8*	*9*	*10*	*12*
Doz	*$3.75*	*4.25*	*4.50*	*5.00*	*5.7*	*6.75*

Net Prices.

Bells—Cow—

Ordinary goods.....75&5@75&10%
High grade.....70@70&10%
Jersey.....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Barton Gong.....55%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....40@40&10%
Yankee Gong.....55%

Hand—

Hand Bells, Polished.....60&5@66⅔%
White Metal.....55@55&10%
Nickel Plated.....50@5 &10%
Swiss.....60@60&10&5%
Silver Chime.....33⅓@33⅓&10%

Miscellaneous—

Farm Bells.....lb. 2@3 4c
Steel Alloy Church and School.....
50&10&5@60%
National Bell Foundry Co.:
Superior Cast Steel Church and School Bells.....50&10&5@60%
Wilmot & Hobbs Mfg. Co., Gongs.....70%

Belting—Rubber—

Agricultural (Low Grade).75&10@80%
Common Standard.....75@75&10%
Standard.....70@70&10%
Extra.....60&10&5%
High Grade.....50&10@50&10&5%
Boston Belting Co.:
Seamless Stitched, Imperial.....45&5%
Boston.....50&5%
Niagara.....60&5%

Leather—

Extra Heavy, Short Lap...50&10@60%
Regular Short Lap.....60@60&5%
Standard.....60&10@65&10%
Light Standard.....65@70%
Leather Lacing.....60&10%

Cotton—

Rossendale-Reddaway B. & H. Co.:
Sphinx Brand.....60&10%
Durable Brand.....70%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters.....20%
Stoddard's Lightning Tire Upsetters.....40&50%

Bicycle Goods—

John S. Leng's Son's 1899 list:
Chain.....50%
Parts.....50%
Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—Tackle—

Common Wooden.....70&10@75%
Cleveland's Steel.....60&10@70%
Ford's Star Brand Self Lubricating.....60&10%
Hollow Steel, Ford's Pat. Star Brand.....50&10%
Lane's Patent Automatic Lock and Junior.....30%
Stowell's Novelty, Mal. Iron.....50&10%
See also *Machines, Hoisting.*

Boards, Stove—

Zinc, Crystal, &c.....40&10@..%

Bolts—

Carriage, Machine &c.—

Common, list Jan. 31, '95..65&2½@..%
Norway Iron, $3.00, list Oct. 7, '84..
80@80&5%
Phila. Eagle, $3.00 list May 24, '99....
80@80&10%
Bolt Ends, list Jan. 30, '95...70&@..%
Machine, list Oct. 1, '99.....70&2½@..%
Machine with C. & T. Nuts.....
65&7½@..%

NOTE—*The rapid advances in manufacturers' prices enable the jobbers to cut prices freely.*

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch	*3*	*4*	*5*	*6*	*8*
Per doz	*$0.26*	*.30*	*.39*	*.47*	*.65*

Cast Iron Spring Foot:

Inch	*6*	*8*	*10*
Per doz	*$1.00*	*1.25*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch	*6*	*8*	*10*
Per doz	*$0.75*	*1.05*	*1.30*

Cast Iron Shutter, Brass Knobs:

Inch	*6*	*8*	*10*
Per doz	*$0.67*	*.80*	*1.00*

Wrought Barrel Brass Knob:

Inch	*3*	*4*	*5*	*6*	*8*
Per doz	*$0.44*	*.50*	*.61*	*.70*	*1.28*

Wrought Barrel.....70&10@75&5%
Wrought " Bronzed.40&5@50&10%
Wrought Flush, B. K..50&10@60&10%
Wrought Shutter...40&10&10@60&5%
Wrought Square Neck.....50@50&10%
Wrought Sunk.....50@50&10%
Ives' Patent Door.....60%

Stove and Plow—

Plow.....60&5@..%
Stove.....77½%

Tire—

Common.....77½%
Norway Iron.....80@80&5%
American Screw Company:
Norway Phila., list Oct. 16, '84....82½%
Eagle Phila., list Oct. 16, '84.....85%
Bay State, list Dec. 28, '99.....77½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84..82½%
Eagle Phila., list Oct. 16, '84.....85%
Eclipse, list Dec. 28, '99.....77½%
Port Chester Bolt & Nut Company
Empire, list Dec. 28, '99.....77½%
Keystone Phila., list Oct. '84.....85%
Norway Phila., list Oct. '84.....82½%
Upson Nut Co.:
Tire Bolts.....77½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch	*1¼*	*1½*	*1¾*	*2*
Per doz	*$4.30*	*5.00*	*5.75*	*7.25*
Inch			*2¼*	*2½*
Per Doz			*$8.65*	*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

Boring Machines—*See Machines, Boring.*

Boxes, Mitre—

C. E. Jennings & Co.....40%
Seavey's, per doz., $30.....40%

Braces—

NOTE.—*Most Braces are sold at net prices.*
Common Ball, American..$1.15@1.25
Barber's.....50&10&10@60&10%
Fray's Genuine Spofford s.....60%
Fray's No. 70 to 120, 81 to 125, 207 to 414.....60%
C. E. Jennings & Co.....50&10%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Patent..50%
P., S. & W. Co Peck's Patent.....
60&10@65&5%

Brackets—

Wrought Steel.....75&5@75&10%
Bradley's Wire Shelf:
Full cases.....80%
Broken cases.....75&10%
Griffin's Pressed Steel.....75%
Griffin's Folding Brackets.....70&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Wire Goods Co.....75%

Buckets, Well and Fire—See *Pails*

Bucks, Saw—

Boss.....₩ gro. $48.00
Hoosier.....₩ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought list Sept., '96.....40@40&5%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....50@50&10%
Fast Joint, Narrow.....50@50&10%
Loose Joint.....70&5@70&10%
Loose Pin.....70&5@70&10%
Mayer's Hinges.....70&5@70&10%
Parliament Butts.....70&5@70&10%

Wrought Steel—

Table and Back Flaps.....60%
Narrow and Broad.....60%
Inside Blind.....60&1 %
Loose Pin.....60&10%
Loose Pin, Ball and Steeple Tip.....75%
Japanned, Ball Tip Butts...60%
Bronzed Wrt. Nar. and Inside Blind Butts.....45&20@45&25%

Extra 25%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....40&10%
Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb..3¼@4c
Sharp, 1 prong.....per lb...4@4½c
Perkins' Blunt Toe.....₩ lb 3½c
Perkins' Sharp Toe.....₩ lb 4 c

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 75	2.10	2.25	each.
Iowa Pattern	....	2.40	2.60	each.
Buffalo Pattern.	....	2.30	2.50	each.
	20	30	40	qts.
New York Patt'rn	3.00	3.25	3.40	each.
Baltimore Patt'rn	2.50	2.85	3.10	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gs
$48.00	60.00	108 g

Caps—Percussion—

Eley's E. B.....60c
G. D.....per M 32@34c
F. L.....per M 37@40c
G. E.....per M 47@50c
Musket.....per M 57@60c

Primers—

Berdan Primers, $1.00.....5%
B. L. Caps (Sturtevant Shells) $1.00.....5%
All other primers.....$1.10@1 15

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges—
Blank Cartridges:
22 C. F., $5.50 ..... *10d5@10d10%*
38 C. F., $7 00 ..... *10d5@10d10%*
22 cal. Rim, $1.50 ..... *10d5@10d10%*
32 cal. Rim, $2.75 ..... *10d5@10d10%*
B. B. Caps, Con., Ball Swgd. $1 80@1.85
B. B. Caps, Round Ball... $1.10@1.15
Central Fire ..... *25@25d5%*
Pistol and Rifle ..... *15d5@15d10%*
Primed Shells and Bullets .....
15d5@15d10%
Rim Fire Sporting ..... *50@50d5%*
Rim Fire, Military .... *15d5@15d10%*

Casters—
Bed ..... *70@70d10%*
Plate ..... *75@75d10%*
Philadelphia ..... *75@75d10%*
Boss *70d10%*
Boss Anti-Friction ..... *70&10%*
Martin's Patent (Phoenix) *45%*
Payson's Anti-Friction ..... *70&10&10&10%*
Standard Ball Bearing *45%*
Tucker's Patent, low list *80%*

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—
American Coil, Cask lots:

3-16	*¼*	*5-16*	*⅜*	*7-16*	*½*	*9-16*
3.00	*6.00*	*5.00*	*4.25*	*4.10*	*4.00*	*4.05*
⅝	*¾ to 1 in.*			*1⅛ to 1¼ inch.*		
3.85	*3.80*			*3.75 per 100 lb.*		

Less than Cask lots add 25c.
German Coil, list July 24, '97..60&10d10%

Halters and Ties—
Halter Chains *50d10%*
German Halter Chain, list July 24, '97 ..... *60&10d10%*
Cow Ties *60%*

Trace, Wagon, &c.—
Traces, Western Standard: 100 pair
6½—6-3, Straight, with ring...$30.00
6½—6-2, Straight, with ring...$31.00
6½—8-2, Straight, with ring...$35.00
6½—10-2, Straight, with ring...$38.00
Add 2c per pair for Hooks.
Twist Traces 2c per pair higher than Straight Link.
Trace, Wagon and Fancy Chains...
50&10@50d10d5%

Miscellaneous—
Jack Chain, list July 10, '93:
Iron ..... *60@60d10%*
Brass ..... *60@60d10%*
Safety Chain ..... *70&5@70d10%*
Gal. Pump Chain ..... *lb. 4@4½c*
Covert Mfg. Co.:
Breast ..... 35&2%
Halter ..... 35&2%
Heel ..... 35&2%
Rein ..... 35&2%
Stallion ..... 35&2%
Covert Sad. Works:
Breast 70%
Halter 70%
Hold Back 70%
Rein 70%
Oneida Community:
Am. Coil and Halters ..... 40@45&5%
Am. Cow Ties ..... 45@50%
Eureka Coil and Halter ..... 45@50&5%
Niagara Coil and Halter ..... 45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%
Wire Dog Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain ..... 60&10%
Universal Dbl-Jointed Chain 50%

Chalk—(From Jobbers.)
Carpenters' Blue ..... *gro. 42@45c*
Carpenters', Red ..... *gro. 37@40c*
Carpenters', White ..... *gro. 33@35c*
See also Crayons.

Chalk Lines—See *Lines.*

Checks, Door—
Bardsley's ..... 40&10%
Columbia ..... 50&10%
Eclipse ..... 60@60&10%

Chests, Tool—
American Tool Chest Co.:
Boys' Chests, with Tools 55%
Youths' Chests, with Tools 40%
Gentlemens' Chests, with Tools 30%
Farmers', Carpenters', etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty 50%
C. E. Jennings & Co.'s Machinists' Tool Chests 20%

Chisels—

Socket Framing and Firmer
Standard List ..... *70d5@7d10%*
Buck Bros 30%
Charles Buck 30%
C. E. Jennings & Co. Socket Firmer No. 10 ..... 60&10%
C. E. Jennings & Co. Socket Framing No. 15 ..... 60&10%
Swan's ..... 70&5%
L. & I. J. White ..... 30@30&5%

Tanged—
Tanged Firmers ..... *40d5@40&10%*
Buck Bros 30%
Charles Buck 30%
C. E. Jennings & Co. Nos. 101, 181... 25%
L. & I. J. White, Tanged ..... 25&5%

Cold—
Cold Chisels, good quality lb. 13@15c
Cold Chisels, fair quality...lb. 11@12c
Cold Chisels, ordinary ..... *lb. 8@9c*

Chucks—
Beach Pat. each $8.00 ..... 20%
Massey's Planer and Milling ..... 15@20%
Skinner Patent Chucks:
Combination Lathe Chucks 40%
Drill Chucks, Patent and Standard ... 30%
Drill Chucks, New Model 2½
Independent Lathe Chucks 40%
Improved Planer Chucks 25%
Universal Lathe Chucks 40%
Face Plate Jaws 40%
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination 40%
Czar Drill 30%
Geared Scroll 30%
Independent 40%
Union Drill 30%
Universal 40%
Face Plate Jaws 35%

Clamps—
Adjustable, Hammers' ..... 20@20&5%
Cabinet, Sargent's ..... 50&10%
Carriage Makers', P., S. & W. Co. 40&10%
Carriage Makers' Sargent's ..... 50&10%
Besly, Parallel ..... 33⅓&10%
Lineman's, Unica Drop Forge & Tool Co 40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners Sidewalk—
Star Socket, All Steel ... ₱ doz. $4.00 net
Star Shank, All Steel ... ₱ doz. $3.75 net
W. & C. Snark, All steel, 7¼ in. ₱ d z., $3.05; 8 in., $3.10; 8½ in., $3.25.

Cleavers, Butchers'—
Foster Bros 30%
New Haven Edge Tool Co.'s 40%
Fayette R. Plumb ..... 33⅓@33⅓&10%
P., S & W ..... 50@50&5%
L. & I. J. White 35%

Clippers—
Chicago Flexible Shaft Company
Handy Toilet ..... ₱ doz. $7.20
Mascotte Toilet ..... ₱ doz. $3.40
Monitor Toilet ..... ₱ doz. $9.00
Stewart's Patent ..... ₱ doz. $10.00

Clips Axle—
Eagle and Superior ¼ and 5-16 inch *70d10%*
Norway, ½ and 5-16 inch..70@70d10%

Cloth and Netting, Wire
—See *Wire, &c.*

Cocks, Brass—
Hardware list:
Compression and Plain Bibbs..65d5%
Globe, Kerosene, Racking, &c., Cocks *65d10%*

Coffee Mills—See *Mills, Coffee.*

Collars Dog—
Brass, Pope & Stevens' list 40%
Embossed, Gilt, Pope & Stevens' list 30&10%
Leather Pope & Stevens' list 40%

Compasses Dividers, &c.
Ordinary Goods ..... *75@75d5%*
Bemis & Call Hdw. & Tool Co.:
Dividers 65%
Calipers, Call's Patent Inside 55%
Calipers, Double 65%
Calipers, Inside or Outside 65%
Calipers, Wing 60%
Compasses 50%
J. Stevens A. & T. Co ..... 25&10%

Compressors Corn Shock—
J. B. Hughes' ₱ doz $2.50

Conductor Pipe, Galva.—
L. C. L. to Dealers:

Territory.	*Not nested.*	*Nested.*
Eastern	*70d2½%*	*70d5%*
Central	*65d10%*	*70%*
Southern ..	*65%*	*65d2½%*
S. Western.	*60d12½%*	*60d15%*

Terms 2% for cash.
Jobbers receive extra 12½d2½% on carloads loose, and extra 12½% on carloads crated.
See also *Eave Troughs.*

Coolers, Water—

Nos.	3	4	5	6
Labrador	$11.50	$14.00	$17.50	$20.00

8 gal. $2 5.00

Nos	3	4	6	8
Iceland..	$23.00	$25.00	$30.00	$37.50

10 14 gal. $57.00 $72.00

Coopers' Tools—
See *Tools, Coopers'.*

Cord— Sash—
Braided, Drab ..... *lb. 25c*
Braided, White, Common..lb. 17@18c
Cable Laid Italian..lb. A, 18c; B, 16c
Common India ..... *lb 9 @9½c*
Cotton Sash Cord, Twisted....12@18c
Patent Russia ..... *lb. 12½@13c*
Cable Laid Russia ..... *lb. 13½@14c*
India Hemp, Braided ..... *lb 14@15c*
India Hemp, Twisted ..... *lb. 10@12c*
Patent India, Twisted ..... *lb. 10@12c*
Pearl Braided, cotton ..... ₱ b 17@18¢
Massachusetts, White ..... ₱ b 22½¢
Massachusetts, Drab ..... ₱ b 26½¢
Eddystone Braided Cotton ..... ₱ b 19¢
Harmony Cable Laid Italian ..... ₱ b 18¢
Ossawan Mills:
Crown, Solid Braided White ... ₱ b 22¢
Braided, Giant, White ..... ₱ b 20¢
Peerless:
Cable Laid Italian ..... 16¢
Cable Laid Russian ..... 14¢
Cable Laid India ..... 12¢
Braided India ..... 18¢
Phœnix, White ..... 19¢
Samson, Nos. 7 to 12:
Braided, Drab Cotton ..... ₱ b 32½¢
Braided, Italian Hemp ... ₱ b 32½¢
Braided, Linen ..... ₱ b 40¢
Braided, White Cotton, Spot ₱ b 28½¢
No. 6 cords, 1¢ extra.
Silver Lake:
A quality, Drab, 40¢ 15%
A quality, White, 35¢ 15%
B quality, Drab, 35¢ 15%
B quality, White, 30¢ 15%
Italian Hemp, 40¢ 15%
Linen, 37½¢ 15%

Wire, Picture—
Braided or Twisted *85d10%*
Note.—There is a good deal of confusion in lists, some using old list and others the new list.

Corn Knives and Cutters
—See *Knives, Corn.*

Corn Planters—
See *Planters, Corn—*

Crackers, Nut—
Little Giant ..... ₱ gr. $24.00

Cradles—
Grain *50%*

Crayons—
White Round Crayons, gross..5½@6c
Cases, 100 gro., $4.50, at factory.
D. M. Steward Mfg. Co.
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square ..... gr. $1.50
Rolling Mill Crayons ..... gr. $2.50
Railroad Crayons (composition) gr. $2.00
Case lots 30%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crooks, Shepherds'—
Fort Madison, Heavy ..... ₱ doz. $7.00
Fort Madison, Light ..... ₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—
Victor Garden ..... ₱ doz. $10.00

Cutlery, Table—
International Silver Company:
No. 12 Medium Knives, 1847.. ₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ..... ₱ doz $3.00
Wm. Rogers & Son ..... ₱ doz. $2 50
Simeon L. & Geo H. Rogers Company:
12 dwt. Medium Knives ..... ₱ doz. $3.00
No. 77 Medium Knives ..... ₱ doz. $2.50

Cutters— Glass—
H. H. Mayhew Co 40%
Smith & Hemingway Co 50%

Meat—
Hale's..Nos. 11 & 111 12 & 112 13 & 113
Per doz .. $9.50 12.50 16.00
American 30%

Nos.	1	2	3	4	5
Each	$5	$7	$10	$25	$50	$60

Connecticut 50%

No...	20	40	60	8	10	12
Each	$1.75	2.00	2.25	3.00	3.00	4.00

Enterprise ..... 25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.50	$4	$6

Dixon's, ₱ doz ..... 30&10@10%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Home No. 1, ₱ doz. $22.75 ..... 50&10%
Little Giant, ₱ doz ..... 33⅓&5@10%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$75.00	$68.00

Sterling ..... 33⅓&5%

Nos	1	2
Each	$3.00	$2.50

New Triumph No. 605, ₱ doz. $34.00 ..... 30&10@10%
Woodruff's, ₱ doz ..... 30&10@40%

Nos	100	150
	$15.00	$18.00

Chadborn's Smoked Beef Cutter, ₱ doz. $60.00
Enterprise Beef Shavers ..... 25@30%

Slaw and Kraut—
Henry Disston & Sons:
Slaw, Corn Grater, &c 40%
Kraut Cutter 24 x 7, 26 x 8, 30 x 9 ..... 55%
Kraut Cutters 36 x 12, 40 x 12 ..... 40%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters 40%
Slaw Cutters, 1 Knife, ₱ gr. ... $18@$20
Slaw Cutters, 2 Knife, ₱ gr... $22@$36

Tobacco—
All Iron, Cheap ..... *doz. $4.25@$4.50*
Enterprise ..... 25@50%
National, ₱ doz. $21.00 ..... 40%
Sargent's, ₱ doz., No. 2 ..... 45&10%
Sargent's No 2 and 21 ..... 50&10%

Washer—
Appleton's, ₱ doz. $16.00 .... 50&10&10%
Bonney's 40%

Diggers, Post Hole, &c.—
Dalbey Post Hole Auger...per doz., $9.00
Iwan's Improved Post Hole Auger... 40%
Iwan's Perfection Post Hole Digger... 30%
₱ doz. $9.00
Kohler's Universal ..... ₱ doz. $14.00
Kohler's Little Giant ..... ₱ d z. $14.00
Kohler's Hercules ..... ₱ doz. $12.00
Kohler's Invincible ..... ₱ doz. $10 00
Kohler's Rival ..... ₱ doz. $9.00
Kohler's Pioneer ..... ₱ doz. $9.00
Never-Break Post Hole Diggers, ₱ doz. $24.00 ..... 60%
Samson, ₱ doz. $34.00 ..... 25%

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Doors, Screen—
Porter's Plain, No. 6 ..... ₱ doz. $6 50
Porter's Ornamental, No. 70, ₱ doz. $10.00

Drawers, Money—
Tucker's Pat. Alarm Till No. 1, ₱ doz. $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Common Blacksmiths' Drill..each $1.50@$1.75
Blacksmiths' Self-feeding.....each $3.75@4.00
Breast, Millers Falls, each $3.00 ..15&10%
Breast, P., S. & W ..... 40@40&5%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills Nos. 2 and 3 ..... 16¢&%
Johnson's Drill Points ..... 25&10%
Ratchet, Curtis & Curtis 25%
Ratchet, Parker's 40%
Ratchet, Weston's ..... 20@25%
Ratchet, Whitney's, P. S. & W 50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00 ..... 33⅓&%

Twist Drills—
Standard List ..... *60d5@65d5%*

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Screw Driver Bits ...per doz. 45@70c
Balsey's Screw Holder and Driver, ₱ doz. ½-inch, $6; 4-in., $7.50 6-in., $9..40%
Buck Bros 30%
Buck Bros' Screw Driver Bits 30%
Champion ..... 40&10%
Douglass Mfg. Co ..... 20@20&10%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet 35%
Goodell's Automatic ..... 50&10@50&10&10&5%
Mayhew's Black Handle 50%
Mayhew's Monarch ..... 40&10%
New England Specialty Co ..... 50&10%
Sargent & Co.'s:
Nos. 1, 50, 55 and 60 ..... 50&10&10%
Nos. 20 and 40 ..... 60½&10%
Smith & Hemenway Co ..... 40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles ..... 60&10%
No. 88 ..... 70&10%
Swan's:
Nos. 65 to 68 ..... 50%
No. 40 ..... 40&10%
Nos. 25, 35 and 45 ..... 20&10&10%

Eave Trough Galvanized

Territory.	*L. C. L.*	
Eastern	*75d10%*	Carloads extra 12½%
Central	*75d7½%*	
Southern	*70d12½%*	
S. Western	*70d10%*	

Terms, 2% for cash.
See also *Conductor Pipe and Elbows.*

Egg Beaters—See *Beaters, Egg*

Egg Openers—
See *Openers, Egg.*

Elbows and Shoes—
Factory shipments ..... *60@60&10%*
Perfect Elbows (S. S. & Co.) 40%

Emery, Turkish—

	4 to 16	*5 to 150*	*Flour*
Kegs ..... *lb.*	*5c*	*5½c*	*3½c*
¼ Kegs ..... *lb.*	*5½c*	*5¾c*	*3¾c*
Kegs ..... *lb*	*5c*	*6c*	

10-lb cans, 10 in case 6½c 7c 6c
10-lb. cans, less than 10 10c 10c 8c
Note.—In lots 1 to 3 tons a discount of 10% is given.

Enameled and Tinned Ware—See *Ware, Hollow.*

Escutcheon Pins—
See *Pins, Escutcheon.*

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's ..... 50&10%

Faucets—
Cork Lined ..... *70d5@70d10d5%*
Metallic Key, Leather Lined ..... *70@70d10%*
Red Cedar ..... *80@80d10%*
B. & L. B. Co.:
Lockport, Metal Plug, reduced list 60&5%
Star ..... 60@60&5%
Star, Metal Plug new list.... 40@40&5%
West's Lock, Open and Shut Key 50&10%
John Sommer's Peerless Tin Key.... 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Metal Key. 50&10%
John Sommer's Duplex Metal Key.... 60%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined.... 50%
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined.. 60%
John Sommer's O. K. Cork Lined..... 50%
John Sommer's No Brand, Cedar..... 50%
John Sommer's Perfection Cedar..... 40%
McKenna, Brass:
Burglar Proof, N. P 35%
Improved, ¾ and ⅞ inch 35%
Self Measuring:
Enterprise, ₱ doz. $36.00 ..... 40&10%
Lane's, ₱ doz. $36.00 ..... 40&10%
National Measuring, ₱ doz. $36.00... 40%

Felloe Plates—
See *Plates, Felloe.*

Files—Domestic—
List revised Nov. 1, 1899.
Best Brands ..... *70@75d5%*
Good Brands ..... *75&10@75d5d10%*
Fair Brands ..... *80@80d10%*
Second Quality ..... *80d10@80d25%*

Imported—
Stubs' Tapers, Stubs' list, July 24, '97 ..... *30%*

Fixtures, Grindstone—
Net Prices:

Inch....	*15*	*17*	*19*	*21*	*24*
Per doz.	*$2.60*	*2.75*	*3.00*	*3 50*	*4 50*

P., S. & W. Co ..... 50@50&5%
Reading Hardware Co 60%
Sargent's ..... 60&10&10%
Stowell's Giant Grindstone Hanger, ₱ doz. $6.00
Stowell's Giant Grindstone Fixtures, Extra Heavy ..... 50&10&10%
Stowell's Grindstone Fixtures Light... 60&10%

Fodder Squeezers—
See *Compressors.*

Forks—
Sept. 1, 1900, list.
Grain or Barley Forks, 18 to 20 inches *70d5%*
Hay, 2 tine *62½%*
Hay, 3 tine *66⅔%*
Hay, 4 tine. Header and Barley Forks, 15 to 16 inches *66⅔%*
Manure, 4 tine *70%*
Manure, 5 and 6 tine *70%*
Spading *70d5%*
Extra 1 @ 3%
Iowa Dig-Ezy Potato 65%
Victor, Hay 66⅔%
Victor, Manure 70%
Victor, Header ..... 60&10%
Champion, Hay 66⅔%
Champion, Manure 70%
Columbia, Hay ..... 66⅔&5%
Columbia, Manure 70%
Columbia, Spading 70%
Hawkeye Wood Barley 4 tine ₱ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger 65%
Acme Hay ..... 66⅔&10&7½%
Acme Manure, 4 tine ..... 66⅔&20&10%
Acme Manure, 6 tine ..... 66⅔&10&2½%
Dakota Header ..... 75&15&5%
Jackson Steel Barley ..... 65&15&5%
Kansas Header ..... 60&5%
W. & C. Favorite Wood Barley 4 tine, ₱ doz., $5.00; 6 tine, $6.00
Plated.—See *Spoons.*

Frames— Saw—
Red, Polished and Varnished..doz. $1.15@$1.35
White ..... *doz. $1.40@$1.60*

Screens and Frames—
See *Screens.*

Freezers, Ice Cream—

Qts...	*2*	*3*	*4*	*6*	*8*	*10*
Best..	*$1.55*	*1.85*	*1.95*	*2.40*	*3.20*	*4.20*
Good	*$1 25*	*1.40*	*1.70*	*2.15*	*2.75*	*3.75*
Fair..	*$1.00*	*1.10*	*1.30*	*1.75*	*2.30*	*3.00*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp Fuse *$2.60*
Cotton Fuse *2.90*
Single Taped Fuse *3.25*
Double Taped Fuse *4.20*
Triple Taped Fuse *5.00*
Extra 10&5%

Gates, Molasses and Oil.

Stebbins' ..... 80@80&10%

Gauges—

Marking, Mortise, &c. ..... 55&10@55&10&10%

Barrett's Comb. Roller Gauge ..... ₱ doz. $6.75@7.25

Stanley R. & L. Co.'s Butt & Babbet Gauge ..... 30&10%

Wire, Brown & Sharpe's 25%

Wire, Morse's 35%

Wire P., S. & W. Co ..... 30@30&10%

Gimlets—Single Cut—

Nail, Metal, Assorted, gro. $1.40@1.60

Spike, Metal, Assorted gro. $2.80@3.25

Nail, Wood Handled, Assorted, gro. $1.75@2.00

Spike, Wood Handled, Assorted gro. $3.25@3.50

Glass, American Window

Jobbers' List, Jan. 21, 1901.

Less than Car Lots from Store 90%

Carloads from Store ..... 90&7½%

Car Lot Consignments, f.o.b. factory ..... 90&12½%

Glue—Liquid, Fish—

List A, Bottles or Cans, with Brush. 37½@50%

List B, Cans (½ pts., pts., qts.) ..... 35%@45%

List C, Cans (¼ gal., gal.) ..... 25@45%

International Glue Co. (Martin's) ..... 40&10&10%

Glue Pots—See *Pots, Glue.*

Grease, Axle—

Common Grade ..... *gro. $5.00@6.00*

Dixon's Everlasting ..... 10-lb pails, ea. 85¢

Dixon's Everlasting, in bxs.. ₱ doz. 1 lb $1.20; 2 lb $2.00

Snow Flake: 1 qt. cans..per doz. $2.00; 2 qt., $3.20; 1 gal. cans per doz. $6.00; 5 gal. $16.00; 5 gal. $24.00 } 10%

Grindstones—

Bicycle Emery Grinder $6.50

Bicycle Grindstones, each ..... $2.50@3.00

Pike Mfg. Co:

Improved Family Grindstones, per inch, per doz. ..... $2.00 } 33⅓&7%

Pike Mower Knife and Tool Grinder, each $3.00

Velox Ball Bearing, mounted, Angle Iron Frames ..... each, $3.25

Guards, Snow—

Cleveland Wire Spring Co.:

Galv. Steel ₱ 1000 ..... $9.00

Copper ₱ 1000 ..... $18.00

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl— *gro.*

Peg Patent, Leather Top ..... *$4.90@5.25*

Peg Patent, Plain Top ..... *$3.50@3.75*

Sewing, Brass Ferrule. ..... *$1.50@1.60*

Saddlers', Brass Ferrule ..... *$1.35@1.45*

Pegs, Common ..... *$1.25@1.35*

Brad, Common ..... *$1.50@1.75*

Halters and Ties—

Covert Mfg. Co.:

Web ..... 45&2%

Jute Rope ..... 45&2%

Sisal Rope ..... 30&2%

Covert's Saddlery Works:

Web and Leather Halters 70%

Jute and Manila Rope Halters 70%

Sisal Rope Halters ..... 60&20%

Jute, Manila and Cotton Rope Ties.. 70%

Sisal Rope Ties ..... 60&20%

Hammers—

Handled Hammers—

Heller's Machinists' ..... 50@50&5%

Heller's Farriers ..... 50@50&5%

Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75 ..... 40&10%

Peck, Stow & Wilcox ..... 50&10%

Fayette R. Plumb:

Plumb, A. E. Nail ..... 33⅓&5@33⅓&10&5%

Engineers' and B. S. Hand ..... 50&10&7½@50&10&10&7½%

Machinists' Hammers ..... 50&10@50&10&10%

Riveting and Tinners' ..... 40&7½@40&10&7½%

Sargent's C. S. New List 45%

Heavy Hammers and Sledges—

3 lb. and under ..... *lb. 45c*

3 to 5 lb. ..... *lb. 36c* } 80@30&10%

Over 5 lb. ..... *lb. 30c*

Wilkinson's Smiths' ..... *9½c@10c lb.*

Handcuffs and Leg Irons

See *Police Goods.*

Handles—

Agricultural Tool Handles—

Axe, Pick, &c ..... *60@60&10%*

Hoe Rake, Fork, &c. ..... *60@60&10%*

Shovel, &c., Wood D Handle ..... *50@50&5%*

Cross-Cut Saw Handles—

Atkins' ..... 40&5%

Champion ..... 45@45&10%

Disston's 50%

Mechanics' Tool Handles—

Auger, assorted ..... *gro. $2.30@$2.50*

Brad Awl ..... *gro. $1.25@$1.50*

Chisel Handles:

Apple Tanged Firmer, gro. ass'd, $2.25@$2.35; large, $2.50@$2.60.

Hickory Tanged Firmer, gro. ass'd $1.75@$2.20; large, $2.50@$3.70.

Apple Socket Firmer, gro. ass'd, $1.70@$1.85; large, $2.00@$2.25

Hickory Socket Firmer, gro ass'd. $1.60@$1.75; large, $1.75@$2.00

Hickory Socket Framing, gro. ass'd. $2.50@$2.75; large, $2.65@$2.85

File, assorted ..... *gro. $1.60@$1.15*

Hammer, Hatchet, Axe, &c *60%*

Hand Saw, Varnished, doz. 70@75c

Not Varnished ..... *55@60c*

Plane Handles:

Jack, doz. 25c; Jack Bolted ..... *55@60c*

Fore, doz. 35@38c; Fore, Bolted ..... *70@75c*

Nicholson Simplicity File Handle, ₱ gro. ..... $0.85@$1.50

Hangers—

Barn Door, New Pattern, Round Groove, Regular:

Inch	3	4	5	6	8
Doz	$0.85	1.20	1.80	1.90	2.50

Barn Door, New England Pattern, Check Back, Regular:

Inch	3	4	5	6
Doz	$1.30	1.75	2.50	3.00

Chicago Spring Butt Co.:

Friction 25%

Oscillating 25%

Big Twin 25%

Chisholm & Moore Mfg. Co.:

Baggage Car Door 50%

Elevator 40%

Railroad 55%

Columbian Hdw. Co.:

American Trackless ..... 33⅓&10%

Cronk Hanger Co.:

Loose Axle 60%

Roller Bearing ..... 60&10%

Lane Bros.:

Parlor, Ball Bearing $4.00

Parlor, Standard $3.25

Parlor, New Model $2.75

Parlor New Champion $2.25

Barn Door, Standard ..... 60&10%

Covered ..... 50&10&10&5%

Special ..... 60&10%

Lawrence Bros.:

Advance 60%

Cleveland 70%

Crown 60%

New York 60%

Peerless ..... 60&10%

Sterling 60%

McKinney Mfg. Co.:

No. 1, Special, $15 ..... 60&10%

No. 2, Standard, $18 ..... 60&10%

Stowell Mfg. and Foundry Co.:

Acme Parlor Ball Bearing 40%

Atlas 60%

Badger Barn Door 50%

Baggage Car Door 50%

Climax Anti-Friction 50%

Elevator 40%

Express 50%

Interstate 60%

Lundy Parlor Door 50%

Magic 50%

Matchless 60%

Nansen ..... 60&10%

Railroad 50%

Street Car Door 50%

Steel, Nos. 300, 404, 500 ..... 40&15%

Stowell Parlor Door 50%

Wild West, Nos. 300, 401, 500 ..... 5%

Zenith for Wood Track 50%

Taylor & Boggs Foundry Co.:

Kidder's ..... 50&15&10&5%

Wilcox Mfg. Co.:

Bike Roller Bearing ..... 60&10%

C. J. Roller Bearing ..... 60&10%

Cycle Ball Bearing 50%

Dwarf Ball Bearing 40%

Ives, Wood Track ..... 60&10%

L.T. Roller Bearing ..... 60&10&5%

New Era Roller Bearing ..... 50&10%

O. K. Roller Bearing ..... 60&10&5%

Prindle, Wood Track 60%

Richards' Wood Track 60%

Richards' Steel Track ..... 50&10%

Spencer Roller Bearing ..... 60&10%

Tandem Nos. 1 and 2 ..... 60%

Underwriters' Roller Bearing 40%

Wilcox Auditorium Ball Bearing 30%

Wilcox Barn Trolley No. 123 ..... 40%

Wilcox Fire Trolley, Roller Bearing 10%

Wilcox Le Roy Noiseless Ball Bearing 40%

Wilcox New Century ..... 50&10&10%

Wilcox Trolley Ball Bearing 40%

Extra 5&10% often given.

Harness Menders—See *Menders.*

Harness Snaps—See *Snaps.*

Hasps—

McKinney's Perfect Hasp ₱ doz. 50%

Wrought Hasps, Staples, &c.—See *Wrought Goods.*

Hatchets—

Best Brands ..... *60@50&10%*

Cheaper Brands ..... *60@60&10%*

Note.—Net prices often made.

Hay and Straw Knives—

See *Knives.*

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1888 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.75	1.45	2.90

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	1	1½	2	2½
Doz. pair	$0.60	.65	.52	.55

Mortise Reversible Shutter, (Buffalo, &c.)

No.	1	1½	2
Doz. pair	$0.65	.60	.55

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%

Parker ..... 70@75%

Reading's Gravity ..... 75&10%

Sargent's, Nos. 1, 3, 5, 11 & 18 ..... 70&10@70&20%

Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $9.20; with screws, $11.15.

Wrightsville H'dware Co.:

O. S, Lull & Porter ..... 80&2½%

Acme, Lull & Porter ..... 75&10%

Queen City Reversible ..... 75&10%

Stenger's Positive Locking, Nos. 1 & 3 ..... 70&10&5%

Shepard's Noiseless, Nos. 50, 65, 55 ..... 70&10%

Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&7½%

1888, Old Pat'n. Nos. 1, 3 & 5 ..... 75&7½%

Tip Pat'n, Nos. 1, 3 & 5 ..... 75&7½%

Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 75&7½%

Shepard's Double Locking, Nos. 20 & 25 ..... 70&10%

Champion Gravity Locking, No. 75 ..... 75&7½%

Steamboat Gravity Locking, No. 10 ..... 75&7½%

Pioneer, Nos. 060, 45 & 5¼ ..... 75&7½%

Empire, Nos. 101 & 103 ..... 70&7½%

W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with Latches	$1.80	1.90	2.65
Hinges only	$1.20	1.40	2.00
Latches only	.60	.80	.65

New England:

With Latch ..... doz. ..... @$1.55

Without Latch ..... doz. ..... @$1.25

Reversible Self-Closing:

With Latch ..... doz. ..... @$1.80

Without Latch ..... doz. ..... @$1.45

Western:

With Latch ..... doz. $1.50@1.75

Without Latch ..... doz. $0.95@1.50

Wrightsville H'dware Co.:

Shepard's or Clark's, doz. sets,

No.	1	2	3
Hinges with Latches	$1.80	2.00	2.75
Hinges only	1.20	1.50	2.10
Latches only	.65	.85	.70

Spring Hinges—

Holdback, Cast Iron, gro. ..... *$7.00@7.25*

Non-Holdback, Cast Iron ..... *gro $6.50@6.75*

J. Bardsley 15%

Bardsley's Patent Checking

Bommer Bros.:

Bommer Ball Bearing Floor Hinges 40%

Bommer Spring Hinges 40%

Chicago Spring Butt Co.:

Chicago 25%

Floor Hinge 50%

Garden City Engine House 25%

Keene's Saloon Door 25%

Triple End 50%

Columbian Hdw. Co.:

Acme, Wrt. Steel 30%

Acme, Brass 20%

American 30%

Columbia, No. 14 ..... ₱ gr. $9.00

Columbia, No. 18 ..... ₱ gr. $25.00

Columbia, Adjustable 30%

Gem new list 25%

Clover Leaf ..... ₱ gr. $12.50

Oxford new list 25%

Hoffman Hinge & Foundry Co.:

No. 70 & 80 Holdback Detachable $8.50

Lawson Mfg. Co.:

Marchi 35%

Matchless Pivot 45%

Payson Mfg. Co.:

Oblique ..... 50&10%

Stover Mfg. Co.:

Ideal, No. 16, Detachable, ₱ gr. $12.50

Ideal, No. 4 ..... ₱ gr. $9.00

New Idea No. 1 ..... ₱ gr. $9.00

New Idea, Double Acting 45%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list Mar. 15, 1901:

Light Strap Hinges *70%*

Heavy Strap Hinges ..... *75&10%*

Light T Hinges *66⅔%*

Heavy T Hinges ..... *60&5%*

Extra Heavy T Hinges *75%*

Hinge Haeps *55%*

Cor. Heavy Strap ..... *75&10%*

Cor. Ex. Heavy T *75%*

Extra 10%

Screw Hook and Strap: 6 to 12 in ..... *lb. 3½c*

14 to 20 in ..... *lb. 3 c*

22 to 36 in ..... *lb. 2½c*

Screw Hook and Eye:

¾ to 1 inch ..... *lb 5 c*

⅝-inch ..... *lb 6 c*

½-inch ..... *lb. 7 c*

Miscellaneous—

Hoffman's Steel Spring Butt Hinges ..... 40&10%

Hoffman's Offset Refrigerator Hinges ..... 40&10%

Hods, Coal—

	15	16	17	18 inch.	
Galv. Open	$2.70	3.00	3.30	3.60	₱ doz.
Jap. Open	$2.10	2.40	2.70	3.00	₱ doz.
Galv. Funnel	$3.30	3.60	3.90	4.20	₱ doz.
Jap. Funnel	$2.70	3.00	3.30	3.60	₱ doz.

Hoes—Eye—

Scovil and Oval Pattern ..... *60c5@60c10c5%*

Grub, list Feb. 23, 1899 ..... 70@70&10%

D. & H. Scovil 35%

Handled—

Sept. 1, 1900, List:

Field and Garden ..... *75&2%*

Ladies', Boys', Toy and Onion ..... *70&10&10%*

Street and Mortar ..... *75&7½&2%*

Cotton ..... *70&10&10&5&2%*

Planters' ..... *70&30%*

Weeding *75%*

Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.

Ft. Madison Crucible Garden Hoe ..... 75&2%

Ft. Madison Crescent Cultivator Hoe, per doz ..... 75&10&2%

Ft. Madison Mattock Hoes:

Regular Weight ..... ₱ doz. $4.50

Junior Size ..... ₱ doz. $4.00

Ft. Madison Sprouting Hoe ..... ₱ doz. $4.80

Ft. Madison Dixie Tobacco Hoe.. 75&20%

Kretsinger's Cut Easy, per doz.... 75&2%

Warren Hoe 60%

W. & C. Ivanhoe ..... 75&2%

B. B. Cultivator Hoe ..... 75&10&2%

Acme Weeding ..... 75&10&2%

W. & C. Lightning Shuffle Hoe, ₱ doz. $4.85

Hog Rings and Ringers—

See *Rings and Ringers.*

Hoisting Apparatus—

See *Machines, Hoisting.*

Hollow Ware—

See *Ware, Hollow.*

Holders—Bit—

Angular, ₱ doz. $24.00 ..... 45&10%

Door—

Empire 50%

File and Tool—

C. E Jennings & Co. Model Tool Holders ..... 33⅓&5%

Nicholson File Holders and File Handles ..... 33⅓&5%

Hooks—Cast Iron—

Bird Cage, Reading 60%

Bird Cage, Sargent's List ..... 50&10@60%

Ceiling, Sargent's List ..... 40&10%

Clothes Line, Hoffman's ..... 40&10%

Clothes Line, Reading List ..... 65&10@65&10&10%

Clothes Line, Sargent's List 50&10&5&10%

Coat and Hat, Sargent's List ..... 45&10%

Clothes Line, Stowell's 70%

Coat and Hat, Stowell's 70%

Coat and Hat, Reading ..... 70@75%

Coat and Hat, Wrightsville ..... 65&10%

Harness, Reading List ..... 70&10@75%

Wire—

Belt *80%*

Wire C. & H. Hooks ..... *60c10@60c10c5%*

Atlas, Coat and Hat:

Single Cases 45%

10 Case Lots ..... 45&10%

Czar Harness ..... 50&10&5%

Wire Coat and Hat:

Acme 60%

B. B 60%

V Brace, Chief and Czar 60%

Gem 60%

Bright Wire Goods—See *Wire.*

Wrought Iron—

Box, 6 in., per doz. $1.50; 8 in.. $1.75; 10 in., $2.00.

Cotton ..... *doz. $1.05@1.25*

Wrought Staples, Hooks, &c.—See *Wrought Goods.*

Miscellaneous—

Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50

Grass ..... *Nos.*	1	2	3	4
Best	$1.50	1.75	2.00	
Common	$1.30	1.30	1.40	1.60

Potato and Manure 70%

Whiffletrees ..... *lb. 4¼c*

Hooks and Eyes:

Brass ..... *60c10c10@70%*

Malleable Iron ..... *70c5@70c10%*

Covert Saddlery Works' Self Locking Gate and Door Hook 60%

Crown Picture ..... 50&10%

Bench Hooks—See *Bench Stops.*

Corn Hooks—See *Knives, Corn.*

Horse Nails—See *Nails, Horse*

Horseshoes—

See *Shoes, Horse.*

Hose, Rubber—

Garden Hose, ¾-inch:

Competition ..... *ft.*	4¼@	4¾c
3-ply Standard ..... *ft.*	5 @	6 c
4-ply Standard ..... *ft.*	8 @	9 c
3-ply extra ..... *ft.*	9 @	10 c
4-ply extra ..... *ft*	11 @	12 c

Cotton Garden, ¾-in., coupled:

Low Grade ..... *ft.*	6 @	7 c
Fair quality ..... *ft.*	8 @	9 c

Irons—Sad—

From 4 to 10 ..... *lb 3@3½c*

B. B. Sad Irons ..... *lb. 3½@4c*

Chinese Laundry ..... *lb. 5@5½c*

Chinese Sad ..... *lb. 3½@3½c*

Mrs. Potts', per set:

Nos. 50	55	60	65
65@70c	60@65c	75@80c	70@75c

New England Pressing ..... *lb.. 3½@3¾c*

Soldering—

Soldering Coppers, 1 & 1¼ lb., 21 @ 23c.; 2 lb., 19 @ 21c

Covert Mfg. Co ..... 20&2½

Smith & Hemenway Co's Sets 70%

Pinking—

Pinking Irons ..... *doz. 50@60c*

Jack Screws—See *Screws.*

Jacks, Wagon—

Covert Mfg. Co., Steel ..... 45&2½

Covert's Saddlery Works':

Daisy ..... 60&10%

Victor ..... 60&10%

Lockport ..... 40@40&10%

Lane's Steel ..... 33⅓&5%

Kettles—

Brass, Spun, Plain ..... 20@25%

Enameled and Cast Iron—See *Ware, Hollow.*

Knife Sharpeners—

See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.—

Foster Bros.' Butcher, &c 30%

Hartzell Cutlery Co ..... 30&5%

Smith & Hemenway Co ..... 40&10%

Hay and Straw—See *Hay Knives.*

Corn—

Ft. Madison Cut-Easy, ₱ doz. $3.25

Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List ..... *70&5@70c10%*

Adjustable Handle 25%

Bradley's 35%

Cantelo's Folding ..... 50@50&5%

C. E. Jennings & Co. Nos. 45, 46 .. 40&10%

Jennings & Griffin ..... 66⅔&5%

Swan's ..... 70&10&2½%

Watrous 25%

L. & I. J. White ..... 20&5@25%

Hay and Straw—

Lightning Pat'n ....per doz .....

Iwan's Sickle Edge ..... ₱ doz. $10.00

Iwan's Serrated ..... ₱ doz., $11.00

Lightning, (Genuine) ..... $6.25@6.50

Maine ..... ₱ doz. $8.50

Mincing—

Buffalo ..... ₱ gro. $15.00

Miscellaneous—

Farriers' ..... *doz. $2.00@3.00*

Westenholm's ..... ₱ doz. $3.00@3.25

Knobs—

Base, 2¼-inch, Birch, or Maple, Rubber tip, gro ..... *$1.20@1.25*

Carriage, Jap, all sizes..gro. 30@33c

Door, Mineral ..... *doz. 60@65c*

Door, Por. Jap'd ..... *doz. 65@70c*

Door, Por. Nickel ..... *doz. $2.00@2.10*

Bardsley's Wood Door, Shutter, &c... 15%

Picture, Sargent's ..... 60&10%

Lacing Leather—

See *Belting, Leather—*

Ladders, Step, Etc.—

Goshen Mfg. Co 50%

Ladies— Melting—
L. & G. Mfg. Co. 25%
P. S. & W. 5%
Reading 5%
Sargent's ..... 40@40&10%

Lanterns— Tubular—
Regular Tubular ..... doz. $4.35@4.75
Side Lift Tubular ..... doz. $4.75@5.25
Square Lift Tubular..doz. $4.75@5.25
Other Styles ..... 40@10@40@10@5%

Bull's Eye Police—
No. 1, 2¾ inch $3.60
No. 2, 3 inch $4.00

Latches, Thumb—
Roggin's Latches ..... doz. 30@33c

Lawn Mowers—
See *Mowers, Lawn.*

Leaders Cattle—
Small ..... dos. 50c; large, 55c
Covert Mfg. Co. ..... 45&2%

Lemon Squeezers—
See *Squeezers, Lemon.*

Lifters, Transom—
Solid Grip, Payson Mfg. Co. 30%
R. & E. 45%

Lines—

Wire Clothes, Nos...	*18*	*19*	*20*
100 feet	*$2.20*	*2.00*	*1.65*
75 feet	*1.80*	*1.70*	*1.50*

Ossawan Mills.
Crown Solid Braided Chalk 33⅓%
Mason's, No. 0 to No. 5 ..... 33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3 ..... 40%
Silver Lake Braided Chalk, No. 0, $6.00;
No. 1, $6.50; No. 2, $7.00; No. 3, $7.50
₩ gr. 30%

Locks— Cabinet—
Cabinet Locks ..... 33⅓&@33⅓&@7⅓&

Door Locks, Latches, &c.—
[Net prices are very often made on these goods.]
Reading Hardware Co. 50%
R. & E. Mfg. Co. 60%
Sargent & Co. ..... 40@40&10%

Elevator—
Stowell's 40%

Padlocks—
Wrought Iron ..... 75@10@5@30@5%
R. & E. Mfg. Co. Wrt. Steel and Brass. 50%

Sash, &c.—
Fitch's:
Bronze and Brass 66⅔%
Iron 70%
Ives' Patent.:
Bronze and Brass 62½%
Iron 65%
Wrought Bronze and Brass ..... 55&5%
Wrought Steel 60%
Payson's Signal 80%
Reading ..... 60&10&10@70%

Machines— Boring—
Common, Upright, Without Augers, $2.00
Common, Angular, Without Augers, $2.25

Without Augers.

R. & E. Mfg. Co.:	Upright.	Angular.
Improved No. 3.	$4.25	No. 1 $5.00
Improved No. 4.	3.75	No. 2 3.38
Improved No. 5.	2.75	
Jennings'	2.50	3.00
Millers' Falls		5.75
Snell's, Rice's Pat.	2.50	2.75
Swan's, No. 500	5.10	No. 200 6.45

Hoisting—
Moore's Anti-Friction Differential Pulley Block 30%
Moore's Hand Hoist, with Lock Brake. 20%
Moore's Portable Pneumatic Hoist 25%

Ice Cutting—
Chandler's 15%

Washing—
Wayne American ..... ₩ doz. $28.00
Western Star, No. 2 ..... ₩ doz. 28.00
Western Star, No. 3 ..... ₩ doz. 30.00
St. Louis, No. 41 ..... ₩ doz. 60.00

Mallets—
Hickory ..... 45&5@50%
Lignumvitæ ..... 45&5@50%
Tinners', Hickory and Applewood, doz. ..... 50@55c

Mats— Door—
Elastic Steel (W. G. Co.) 10%

Mattocks—
See *Picks and Mattocks.*

Meat Cutters—
See *Cutters, Meat.*

Milk Cans—See *Cans, Milk.*

Mills— Coffee—
Enterprise Mfg. Co. ..... 25@30%
National, list Jan. 1, '94 ..... 30%
Parker's Columbia and Victor @ ..... 50&10@60%
Parker's Box and Side ..... 50&10@60%
Swift, Lane Bros. 30%

Mincing Knives—
See *Knives, Mincing.*

Molasses Gates—
See *Gates, Molasses.*

Money Drawers—
See *Drawers, Money.*

Mowers, Lawn—
Net prices are generally quoted.
Cheap ..... all sizes, $1.90@1.95
Good ..... all sizes, $2.25@3.50

	10	*12*	*14*	*16-inch*
High Grade	*4.25*	*4.50*	*4.75*	*5.00*

Continental ..... 60&10&5%
Great American ..... 70&5%
Great American Ball Bearing ..... 60&10&3%
Quaker City ..... 70&5%
Pennsylvania ..... 60&10&5%
Pennsylvania Golf 50%
Pennsylvania Horse 60%
Pennsylvania Pony 45%
Philadelphia:
Styles K., S., C., K., T. ..... 70&5%
Style A, all Steel ..... 65&10%
Style E, Low Wheel ..... 60&10%
Style E, High Wheel ..... 70&10&5%
Drexel and Gold Coin, low list ..... 50&5%

Nails—
Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899 .85&10@85&10&10%
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
A. C.	.25¢	23¢	22¢	21¢	21¢	....40&5%
Ausable	.28¢	26¢	25¢	24¢	23¢	..50&10%
Capewell	.19¢	18¢	17¢	16¢	16¢	....10&5%
C. B. K.	.25¢	25¢	23¢	21¢	21¢	.....40%
Champ'n	28¢	26¢	25¢	24¢	23¢	.....
						40&10&5%
Clinton	....19¢	17¢	16¢	15¢	14¢	....
						30&10&5%
Maud S.	.25¢	23¢	22¢	21¢	21¢	..... 50%
Neponset	.23¢	21¢	20¢	19¢	18¢	..... 40%
Putnam	.23¢	21¢	20¢	19¢	18¢	..... 33⅓%
Vulcan	...23¢	21¢	20¢	19¢	18¢	...25&10%

American, Nos. 5 to 16 ₩ lb. ..... 9@9½¢
Jobbers' special brands...per lb. 8@9c

Picture

	1½	*2*	*2½*	*3*	*3½ in.*
Brass Head	*.55*	*.60*	*.70*	*.95*	*1.00 gro.*
Por. Head	*..*	*1.10*	*1.10*	*1.10*	*.. gro.*

Nippers, See *Pliers and Nippers.*

Nut Crackers—
See *Crackers, Nut.*

Nuts—
Cold Punched: Off list.
Mfrs. or U. S. Standard.
Square, plain ..... $5.00@5.10
Hexagon, plain ..... $5.20@5.40
Square, C. T. & R. ..... $5.20@5.30
Hexagon, C. T. & R. ..... $5.80@5.90
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank ..... $5.20@5.30
Hexagon Blank ..... $5.80@ .90
Square Tapped ..... $5.00@5.10
Hexagon Tapped ..... $5.60@5.70

Oakum—
Best or Government ..... lb. 6¼c
Navy ..... lb. 5 c
U. S. Navy ..... lb. 5¼c
Plumbers' Spun Oakum 8¾c
In carload lots ¼c lb. off f.o.b. New York.

Oil Axle—
Snow Flake:
1 pt. cans, per doz. $3.00
1 qt. cans, per doz. $4.80
1 gal. cans, per doz. $15 00
5 gal. cans, per doz. $66.00
} 33⅓&10%

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper ..... 40@10@50%
Tin or Steel ..... 60@10@65%
Zinc ..... 60@10@65%
Paragon:
Brass and Copper ..... 40@10%
Tin or Steel ..... 60@10%
Zinc ..... 60@10%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₩ doz. 20%
Malleable, Hammers' Old Pattern, same list ..... 50&10%
Wilmot & Hobbs Mfg. Co:
Spring Bottom Cans ..... 70@70&10%
Railroad Oilers etc. ..... 60@60&10%

Openers— Can—
French ..... doz. 35c
Iron Handle ..... doz. 25@27c
Sprague, Iron Hdle..per doz. 35@40c
Sardine Scissors...doz. $1.75@$3.00
Tip Top ..... per doz. $0.75
National, ₩ gro. ..... $1.75@$2.00
Stowell's ..... per doz. 35@45¢
Waldorf, ₩ gro. $8.65

Egg—
Nickel Plate ..... per doz., $2.25
Silver Plate ..... per doz., $3.50

Packing—
Asbestos Packing, Wick and Rope, 15@15½c lb.

Rubber—
Sheet, C. I. ..... 8@12c
Sheet, C. O. S. ..... 9@13c
Sheet, C. B. S. ..... 10@14c
Sheet, Pure Gum ..... 50@70c
Sheet, Red ..... 35@40c
Jenkins' Standard, ₩ lb 80¢....25@25&5%

Miscellaneous—
American Packing ..... 7@10c lb.
Cotton Packing ..... 13@14c lb.
Italian Packing ..... 9@12½c lb.
Jute ..... 3½@4c lb.
Russia Packing ..... 7@11c lb.

Pails— Creamery
S. & C. Co., with gauges.. No 1 $6.50; No. 2, $5.75 ₩ doz.

Galvanized—
Price per gro.

Quart	*10*	*12*	*14*
Water, Regular	*18.00*	*21.00*	*24.00*
Water, Heavy	*25.00*	*27.50*	*30.00*
Fire, Rd. Bottom	*31.00*	*33.00*	*35.00*
Well	*27.00*	*29.00*	*31.00*

Pans— Dripping—
Standard List ..... 50@10@50@10%

Fry—
Common Lipped:

No.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.60*	*.75*	*.85*	*.95*	*1.15*

Roasting and Baking—
Regal, S. S. & Co., ₩ doz., Nos. 5, $4.50; 10 $5.00; 20, $5.50; 30, $6.00
Simplex, ₩ gro., No. 40 $30.00; 50, $34.50; 80 $39 00; 140, $33.00; 150, $37.50; 160, $42.00.

Paper—Building Paper—
Asbestos: lb.
Building Felt 3c
Mill Board, sheet, 40 x 40 inches...4c
Mill Board, roll, thicker than 1-16 inch 3c
Mill Board, roll, 1-16 in. thick and less 3c
Per roll
Rosin Sized Sheathing: 500 sq. ft.
Light wt., 20 lbs. to roll $0.23
Medium wt., 30 lbs. to roll $0.47
Heavy wt., 50 lbs. to roll $0.58
Medium Grades Water Proof Deafening Felt, 2, 3 and 4 sq. ft. to lb., ton ..... $36.00@37.00
Red Rope Roofing, 250 sq. feet per roll $1.65

Tarred Paper.
1 ply (roll 300 sq. ft.), ton...$26 00@27.00
2 ply, roll 108 sq. ft. ..... 5@50c
3 ply, roll 128 sq. ft. ..... 6@70c
Slater's Felt (roll 500 sq. ft.)..50@60c
R. E. M. Stone Surfaced Roofing (roll 110 sq. ft.) $2.75

Sand and Emery—
List Dec. 23, 1899..50&10@50&10@10&10%

Parers— Apple—

Advance	₩ doz.	$4.50
Baldwin	₩ doz.	$5.00
Bonanza	each	$5.00
Dandy	each	$7.50
Eureka, 1898	each	$16.00
Family Bay State	₩ doz.	$12.00
Hudson's Little Star	₩ doz.	$4.00
Hudson's Rocking Table	₩ doz.	$5.50
Improved Bay State	₩ doz.	$27.00@30.00
New Lightning	₩ doz.	$5.50
Reading 72	₩ doz.	$4.00
Reading 78	₩ doz.	$7.00
Turn Table '98	₩ doz.	$5.50
White Mountain	₩ doz.	$4.00

Potato—

Saratoga	₩ doz.	$5.50
White Mountain	₩ doz.	$4.50

Picks and Mattocks—
List Feb. 23, 1899 ..... 70@70&10%

Pigeons— Clay
Markle's Black Birds, f.o.b. factory, per M $3.75
See also *Traps, Target.*

Pinking Irons—
See *Irons, Pinking.*

Pins— Escutcheon—
Brass 60%
Iron, list Nov. 11, '85 ..... 60%

Pipe, Cast Iron Soil—
Standard, 2-6 in. ..... 60@7½%
Extra Heavy, 2-6 in. 70%
Fittings ..... 75@5%
NOTE.—*Carload lots to jobbers 10% less, and freights allowed.*

Pipe, Merchant, Boiler Tubes, &c.—
Less than Carloads to Consumers.

	Merchant Pipe. *Black.*	*Galvanized*
⅛ to ½ inch	61%	48%
¾ to 10 inch	68½%	56%
Boiler Tubes		*Up to*
Steel.		*22 feet*
1 to 1¼ inch and 2¾ to 5 inch inclusive		65½%
2 to 2½ inch, inclusive		60%
6 to 10 inches		59%
Iron.		
1 to 1¼ inch and 2½ in.		43½%
1¾ to 2 inch		53%
2¼ to 12 inch		55%
Casing, Cut Lengths.	*S. & S.*	
2 to 3 inch		53½%
3¼ to 4 inch		59%
4¼ to 12½ inch		61½%

NOTE.—*Prices are largely nominal owing to scarcity of Pipe. Jobbers are obtaining almost any price they ask.*

Pipe, Sewer—
Standard Pipe and Fittings, 2 to 24 in.
New England 70%
New York and New Jersey 75%
Ohio and Michigan 80%
Carload lots are generally delivered.

Planes and Plane Irons—

Wood Planes—
Molding ..... 40@2½@40@10%
Bench, First quality ..... 45@10@45@10@5%
Bench, Second quality ..... 50@10@50@10@5%
Bailey's (Stanley R. & L. Co) ..... 50&10@50&10@10%
Gage Self Setting 35%

Iron Planes—
Bailey's (Stanley R. & L. Co) ..... 50&10@50&10@10%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 25&10@25&10@10%
Sargent's ..... 50&10@10%

Plane Irons—
Wood Bench Plane Irons ..... 50@5@50@10@5%
Buck Bros. 30%
Stanley R. & L. Co... 50&10@50&10@10%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand.
Kohler's Eclipse ..... ₩ doz. $9.00

Plates—
Felloe ..... lb. 5¾@4c
Self-Sealing Pie Plates (S. S. & Co.), ₩ doz. $2.00 ..... 50%

Pliers and Nippers—
Button Pliers ..... 70@10@75%
Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45
Gas Pipe.. 7 8 10 12-in.
$1.75 $2.00 $2.75 $3.75
Acme Nippers ..... 50@50&5%
Bernard's:
Parallel Pliers, &c. 35%
Paragon Pliers ..... 50&5%
Lodi Pliers ..... 50&5%
Elm City Fence Pliers 35%
Cronk Hanger Co.:
American Button ..... 75&10%
Cronk's 60%
Improved Button ..... 70&10%
Stub's Pattern 50%
Combination and others 25%
Heller's Farriers' Nippers, Pincers, and Tools 50@50&5%
P., S. & W. Tinners' Cutting Nippers, 30@30&10%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Plumbs and Levels ..... 75@75&10%
Davis Iron, Machinist Nos. 1 to 14 ..... 20%
Davis Iron, Adjustable Nos. 6 to 49 ..... 35%
Disston's 70%
Pocket Levels ..... 75&10&10@75&10%
Stanley R. & L. Co ..... 70&10@70&10&10%
Stanley's Duplex ..... 25&10@25&10&10%
Woods' Extension 33⅓%

Poachers, Egg—
Buffalo Steam Egg Poachers, ₩ doz., No. 1, $7.20; No. 2, $11.00 No. 3, $11.00; No. 4, $14.50 ..... 50%

Points, Glaziers'—
Bulk and 1 lb. papers.. lb. 8 c@..
½-lb. papers ..... lb. 8½c@..
¼-lb. papers ..... lb. 9 c@..

Pokes, Animal—
Ft. Madison Hawkeye ..... ₩ doz. $3.25
Ft. Madison, Western ..... ₩ doz. $3.75

Police Goods—
Manufacturers' Lists ..... 25@25&5%
Tower's 25%

Polish—Metal—
Prestoline Liquid, No. 1 (½ pt.), ₩ doz. $3.00; No. 2 (1 qt.), $9.72 ..... 40%
Prestoline Paste ..... 40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gr. $4.50; ½ lb boxes, ₩ doz. $1.25; 1 lb boxes, ₩ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₩ doz. $1.25; ₩ gr. $12.00.
Barkeepers' Friend Metal Polish, ₩ doz. $1.75; ₩ gr. $18.00.
Wynn's White Silk, ¼ pt. cans, ₩ doz. $2.00

Stove—
Black Eagle Benzine Paste, 5 lb cans ₩ lb 10¢
Black Eagle, Liquid, ½ pt. cans ₩ doz. 75¢
Black Jack Paste, ¾ lb cans, ₩ gro. $9.00
Ladd's Black Beauty, gr. $10.00 ..... 50%
Joseph Dixon's, ₩ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ₩ lb 8¢
Fireside ..... ₩ gr. $2.50
Gem, ₩ gr. $4.50 ..... 10%
Japanese ..... ₩ gr. $3.50
Jet Black ..... ₩ gr. $3.50
Peerless Iron Enamel, ½ pt. cans ₩ doz. $1.50
Wynn's:
Black Silk, 5 lb pail ..... each 70¢
Black Silk, ½ lb box ..... ₩ doz. $1.00
Black Silk, 5 oz. box ..... ₩ doz. $0.75
Black Silk, ½ pt. liq ..... ₩ doz. $1.00

Poppers, Corn—
Round or Square:
1 qt. ..... gro. $7.00@$7.50
1½ qt. ..... gro. 9.50@ 10.00
2 qt. ..... gro. 10.50@ 11.00

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Potato Parers—
See *Parers, Potato.*

Pots— Glue—
Enameled 15%
Tinned 40%

Powder—
In Canisters:
Duck, 1 lb. each 15c
Fine Sporting, 1 lb each 75c
Rifle, ½-lb. each 15c
Rifle, 1-lb. each 25c
In Kegs:
Duck, 6¼-lb. kegs $2.25
Duck, 12½-lb. kegs $4.25
Duck, 25-lb kegs $8.00
Rifle, 6¼-lb kegs $1.25
Rifle, 12½-lb. kegs $2.25
Rifle, 25-lb. kegs $4.00
King's Semi-Smokeless:

	Keg (25 lb bulk)	Half Keg (12½ lb bulk)	Quarter Keg (6¼ lb bulk)	Case 24 (1 lb cans bulk)	Half case 12 (1 lb cans bulk)
	$6.50	$3.50	$1.90	$14.00	$7.25

King's Smokeless:

	Shot Gun	Rifle
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb cans bulk)	7.25	8 75

Presses— Fruit and Jelly—
Enterprise Mfg. Co. ..... 20@25%

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—
Cyclops ..... 40@40&10%
Smith & Hemenway Co.:
Diamond B, No. 2, case lots, ₩ doz $6.00
Diamond B, No. 3, case lots, ₩ doz $5.50
Giant, No. 1, ₩ doz. $18; No. 2, $16.50; No. 3, $15 ..... 40%
Miller's Falls, No. 3, per doz. $12.00 ..... 15&10%
Pelican ₩ doz. $9.00 ..... 40&10%
Scranton, Case Lots:
No. 1 (large), ₩ doz. $8.50; No. 2 (large), $5.75; No 3 (small), $5.00; No. 2-B (large), $5.50; No. 3-B (small), $5.00; No. 2-D (large), $4 50; No 3-D (small) $4.00.

Pulleys—Single Wheel—

Inch	*2*	*2½*	*3*
Awning ..doz.	*$0.45*	*.70*	*.95*
Inch	*2*	*2¼*	*2½*
Hay Fork, Swivel or Solid Eye ..... doz.			*$1.35@1.50*
Hot House, doz	*$0.65*	*.90*	*1.20*
Inch	*1¼*	*1¼*	*1¾*
Screw ..... doz.	*$0.15*	*.20*	*.25*
Inch	*1¼*	*1¾*	*2¼*
Side ..... doz.	*$0.30*	*.40*	*.55*
Inch	*1¼*	*1¾*	*2¼*
Tackle ..... doz.	*$0.30*	*.45*	*.65*

Stowell's:
Ceiling or End, Anti-Friction 60%
Dumb Waiter, Anti-Friction ..... 60&10%
Hay Fork, Anti-Friction, 5-in. Wheel, ₩ doz. $12.00 ..... 50%
Electric Light 60%
Side, Anti-Friction ..... 60&10%

Sash Pulleys—
Common Frame; Square or Round End per doz., 1¾ in., 15c.; 2 in., 18c
Auger Mortise, no Face Plate, per doz. 1¾ in., 12c.; 2 in., 15c.
Auger Mortise, with Face Plate, per doz., 1¾ in., 13c.; 2 in., 15½c.

Acme ..... 1¾ in., 16¢; 2 in., 19¢
Common Sense, 1¾ in.... ₱ doz., 18¢; 2 in., 20¢.
Fox All-Steel, Nos. 3 and 7, 2¼ in..... ₱ doz. 25¢
No. 9, 1¼ in..... ₱ doz. 20¢
Extra for Plated Finish..., ₱ doz. 20¢
Extra for Anti-Friction Bronze Bushing..... ₱ doz 10¢
Grand Rapids All Steel Noiseless.... 40%
Ideal No. 13..... 1¾ in., ₱ doz.. 16¢
Niagara..... 1¾ in., 16¢; 2 in., 19¢
No. 26, Troy..... 1¾ in., 14¼¢; 2 in., 16¢
Star..... 1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern.....60@6¢&10%
Pitcher Spout.....75@75¢&10%
Wood.....50@50¢&10%
Pump Leathers, Lower and Plunger Valves—Per gro:

Inch	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch	3	3¼	3½	3¾	4
	$3.30	3.60	3.85	4.10	4.40

Barnes Dbl. Acting (low list)..... 50%
Flint & Walling's Fast Mail (low list).50%
Flint & Walling's Pitcher Spout.....75%
Load's Suction Pumps, U. S. Co.....20%
Myer's Pumps, low list 50%
Contractors' Rubber Diaphragm Non-chokable, B. & L. Block Co.....30%

Punches—

Revolving (4 tubes)...doz. $3.75@4.25
Saddlers or Drive, good...doz. 65@70c
Spring, single tube, good quality... $1.65@1.75
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....55%
Bemis & Call Co.'s Spring.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches ..... 55&10%
Steel Screw, B & K. Mfg. Co.....40%
Tinners' Hollow, P., S. & W. Co..... 35@3¾&5%
Tinners' Solid, P., S. & W.Co., ₱ doz., $1.44..... 60%

Rail— Barn Door, &c.—

Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:

⅛	¼	¾	In.
$1.70	$2.10	$5.00	100 feet.

Angular for Sq. Groove Wheels:

Small.	*Med.*	*Large.*	
$1.60	1.95	2.70	100 feet.

*Sliding Door, Brnzed Wr't Iron, ft.*5½c
Sliding Door, Iron Painted....3½@3c
Sliding Door, Wrought Brass, 1¼ in..... lb. 36c..30c
Cronk's Double Braced Steel Rail, ₱ foot..... 3¼¢
Cronk's O. N. T. Rail..... 3¼¢
Lanes' O. N. T., ₱ 100 ft., 1 inch... $2.85
Lanes' Standard, ₱ 100 ft..... 3.75
Lawrence Bros.' ..... ₱ ft. 4¼¢
McKinney's None Better..... ₱ ft. 3¾¢
McKinney's Standard..... ₱ ft. 4 ¢
Stowell's Cast Rail..... 1½¢
Stowell's Steel Rail, Plain..... 2½
Stowell's Wrought Bracket, Plain.... 3¼¢

Rakes—

Net Prices, Malleable Rakes:

	10	*12*	*14*	*16-tooth*
Shank	$1.50	1.60	1.75	1.85
Socket	$1.65	1.80	1.95	2.10

Sept. 1, 1900, List:
Cast Steel.....70¢&5¢&2%
Malleable.....70¢&10@75¢&5%
Lawn Rakes, Metal Head, per doz.,
20 teeth.....$3.25@3.50
24 teeth.....$3.60@3.75
Fort Madison Red Head Lawn.....$1.25
Fort Madison Blue Head Lawn.....$1.00
Jackson Lawn, 29 and 30 teeth..... ₱ doz. $1.00
Kohler's:
Lawn Queen, 20-tooth, ₱ doz.....$3.60
Lawn Queen, 24-tooth, ₱ doz.....$3.75
Paragon, 20-tooth, ₱ doz.....$2.85
Paragon, 24-tooth, ₱ doz.....$3.00
Steel Garden, 14-tooth, ₱ doz.....$3.00
Malleable Garden, 14-tooth ₱ doz. $2.25

Rasps, Horse—

Disston's..... 75%
Heller Bros..... 70&5%
McCaffrey File Co Horse Rasps.60&10&5%
New Nicholson Horse Rasp.....70&10%
See also *Files.*

Razors—

Boracle..... 70%
Fox Razors, No. 42,..₱ doz. $40.00
Fox Razors, No 44,..₱ doz. $24.00
Fox Razors, No. 82, Platina, ₱ doz $24.00 } 40% dis.
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors..... 40%
Safety Razors..... 40%

Razor Strops—

See *Strops, Razor.*

Reels— Fishing—

Kendryx Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Populo and Salmon, Single Action, Multiplying and Quadruple, all sizes..... 25%
Kendryx Single Action Series, 102P and PN, 202P and PN, 102 PR and PRN, 302 PR and PRN, 304 P and PN, 00304P and PN, 502 and 502N, 802 and 802N, 02084N, Competitor.50%
Kendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2004N, 2004P and PN, 00200&PN, 0024 and 0024N, 5009N and PN.....40&10%
Shakespeare, Style C..... 25%

Registers—

List Sept. 2, 1901.

Black Jap, *White Jap*, *Bronzed*, *Nickel Plated*, *Electro Plated* } 60&10&5% @ 70&5%

There is a good deal of irregularity in prices of Registers, especially in Black Japanned, and some jobbers and manufacturers are using the old list.

Revolvers—

Single Action.....80@85c
Double Action..... $1.30
Automatic $2.75
Nonmerless..... $7.85

Riddles, Grain or Sand—

16 in. per doz.....$2.00@$2.25
17 in. per doz. .. ..$2.25@$2.50
18 in. per doz.....$2.50@$2.75

Rings and Ringers—

Bull Rings—

	2	2½	3 *Inch.*
Steel	$0.80	0.90	0.95 doz.
Copper	1.10	1.20	1.50 doz

Hog Rings and Ringers—

Hill's Rings....gro. boxes, $1.00@1.50
Hill's Rings, Gray Iron, doz. 50@55c
Hill's Ringers, Mal. Iron, doz. 75@80c
Blair's Rings.....per gro. $5.75@6.00
Blair's Ringers...per doz. $0.65@ .70
Brown's Rings....per gro. $6.00@6.25
Brown's Ringers..per doz. $1.00@1.10
Rapid Rings..... ₱ gro. $6.00
Rapid Ringers..... ₱ doz. $0.50

Rivets and Burrs—

Copper.....50@50¢&5%
Iron or Steel:
Tinners' .....70@70¢&10%
Miscellaneous .....70@70¢&1%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rollers—

Acme, Stowell's Anti-Friction..... 50%
Barn Door, Sargent's list..... 50&10&10%
Cronk's Stay..... 6⅓%
Cronk's Brinkerhoff..... 66⅔%
Lane's, Stay..... 33⅓%
Stowell's Barn Door Stay...₱ doz. $1.25

Rope—

Manila, 7-16 in. and larger ..... lb. 12¼@13 c
Manila.....¾-inch .....lb. 13¼@13½c
Manila ¼ & 5-16 in......lb. 13½@14 c
Manila, Tarred Rope, 15 thread.....lb 12¾@11 c
Manila Hay Rope. Medium.....lb 12¼@13 c
*Sisal, 7-16 in. and larger*lb. 8 @ 9 c
Sisal .....¾-inch..lb. 9¼@ 9½c
Sisal ¼ and 5-16 in.....lb. 9¼@10 c
Sisal, Hay Rope, 2 to 10 ply.....lb. 9 @ 9¼c
Sisal, Tarred, Medium Lath Yarn.....lb. 8½@ 8¾
Cotton Rope:
Best.....¼-in. and larger lb. 13½c
Medium..¼-in. and larger lb. 11 c
Com.....¼-in. and larger lb. 9 c
Jute Rope:
Thread No. 1, ¼ in. and up lb. 6½c
Thread No. 2, ¼-in. and up lb. 6 c
Yarn, ¼ in and up..... lb. 5 c

Wire Rope—

Galvanized .....25¢7½&5%
Plain.....50¢7½&5%

Ropes, Hammock—

Covert Mfg. Co.....45&2%
Covert Saddlery Works.....60&5%

Rules—

Boxwood.....75¢10¢10¢10@75¢10¢10¢10¢5%
Ivory .....85¢10¢10@35¢10¢10¢5%
Chapin-Stephens Co.:
Boxwood.....75&10&10@75&10&10&10%
Ivory.....85&10@35&10&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber .....50&10%
Stanley R. & L. Co.:
Boxwood...75&10&10@75&10&10&10%
Ivory.....85&10@35&10&10%
Upson Nut Co.:
Boxwood...75&10&10@75&10&10&10%
Ivory.....—35&10@35&10&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—

See *Paper and Cloth.*

Sash Cords—See *Cord, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers Sausage.*

Saw Frames—See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins:
Circular.....50@50&10%
Band .....50&10@60%
Cross Cuts .....85&5%
Mulay, Mill and Drag .....50&10%
One-Man Saw.....40%
Wood Saws 40%
Hand, Compass, &c.....40%
Disston's:
Circular Solid and Inserted Tooth.50%
Band 2 to 14 in. wide.....60%
Band ¼ to 1¾.....70%
Crosscuts.....45@45&10%
Narrow Crosscuts.....50@50&10%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35@35&7½%
Wo dsaw Blades.....40@40&7½%
Woodsaw Rods..... 25%
Hand Saws, Nos. 12, 99, 9, 16, 4100, D8, 120, 76, 77, 8.....25@25&7½%
Hand Saws, Nos 7 (07, 107), 3, 1, 0, 00, Combination.....30@30&7½%
Compass, Keyhole, &c.....25@25&7½%
Butcher Saws and Blades..35@35&7½%
C. E. Jennings & Co.'s.:
Back Saws.....35%
Butcher Saws.....35%
Compass and Key Hole Saws.....25%
Framed Wood Saws.....40%
Hand Saws.....25@30%
Wood Saw Blades.....45%
Peace:
Circular and Mill 50%
Cross Cuts, list Jan. 1, '99.....50%
Hand, Panel and Rip.....30%
Richard-on:
Circular and Mill.....50%
Hand, &c.....30%
X Cuts, list Jan. 1, '99.....50%
Simonds:
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws..50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....25@25&7½%
Hand Saws.....25@25&7½%
Compass, Keyhole, &c .....25@25&7½%
Wood Saws .....25@25&7½%

Hack Saws—

Disston:
Concave Blades.....25%
Keystone.....30%
Hack Saw Frames.....30%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180, 330.....40%
Hack Saws, Nos. 175, 180, 330, complete.....40%
Griffin's Hack Saw Frames 45%
Griffin's Hack Saw Blades 45%
Star Hack Saws and Blades.....15&10%

Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scale Beams—

See *Beams, Scale*

Scales—

Family, Turnbull's.....30@30¢10%
Counter:
Hatch. Platform, ½ oz to 5 lbs. doz $5.50
Two Platforms, ½ oz to 8 lbs. doz. $11
Union Platform, Plain...$1.70@1.90
Union Platform, Striped $1.85@2.15
Chatillon's:
Eureka.....25%
Favorite.....40%
Grocers' Trip Scales.....50%
Pelouze Scales—Household, Counter Confectionery, Postal, Ice, &c.....20%
"The Standard" Platform.....40%
"The Standard" R. R. and Wagon.....50%

Scrapers—

Box. 1 Handle.....doz $2.25@2.50
Box. 2 Handle..... ...doz. $3.75@4.00
Ship, No 1, doz. $3 50; No 2. $2 25@2.40
Adjustable Box Scraper (S. R. & L. Co.) $3.00..... 30&10%

Screens, Window, and Frames—

Bonanza Window Screens.....60@60&5%
Cortland Victor Screens.....60@60&5%
Flyer Pattern Window Screen..60@60&5%
Maine Window Screen Frames.40&10&5%
Perfection Window Screens.....60@60&5%
Phillips' Window Screen Frames. 60&10&5%
Porter's Hummer Window Screens. 60@60&5%
Porter's Klondike Window Screens ... 60&2½@60&7½%
Wabash Spring Adj. Screen. 50%
See also *Doors.*

Screw Drivers—

See *Drivers, Screw.*

Screws—Bench and Hand—

Bench, Iron...doz. 1 in., $3.00@3.25; 1¼, $3.50@3.75; 1¼, $4.00@4.50
Bench, Wood, Beech..doz. $3.50@3.75
Hand, Wood.....50¢5@50%
Hand, R. Bliss Mfg. Co.....35%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1, '99.....75¢5@..%
Coach and Lag, Gimlet Point, list Oct. 1, '99.....75@...%
Hand Rail, list Jan. 1, '81.60¢10@...%

Jack Screws—

Standard List.....75@75¢10%
Millers Falls.....50&10&10%
Millers Falls, Roller .....50&10%
P., S. & W.....50@50&5%
Sargent.....70&10%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron.50@50¢10%
Flat or Round Head, Brass50@50¢10%

Set and Cap—

Set (Iron or Steel) .....70¢10¢10%
Sq. Hd. Cap.....65¢10¢10%
Hex. Hd. Cap.....65¢10¢10%
Rd. or Fillister Hd. Cap...60¢10¢10%

Wood—

List Jan. 1, 1900.
Manufacturers' printed discounts:
Flat Head, Iron.....87½@90%
Round Head, Iron.....85@87½%
Flat Head, Brass.....85@87½%
Round Head, Brass.....82½@85%
Flat Head, Bronze.....75@80%
Round Head, Bronze.....72½@77½%
Drive Screws.....87½@90%
NOTE.—*Extra 5@10% often given*

Scroll Saws—See *Saws, Scroll*

Scythes— Per doz.

Clipper Pattern, Grass.....$4.25
Full Polished Clipper.....$4.75
Grain $7.00
Clipper, Grain.....$7.50
Wood and Bush.....$4.50

Scythe Snaths—

See *Snaths, Scythe.*

Seeders— Raisin—

Enterprise..... 25@30%

Sets— Awl and Tool—

Brad Awl and Tool Sets:
Wood Hdle., 10 Awls doz. $2.00@2.25
Wood Hdle., 14 Awls, 6 Tools.... doz. $2.50@2.60
Aiken's Sets, Awl and Tools:
No. 20, ₱ doz. $10.00.....50&10&10%
Fray's Adj. Tool H dle.. Nos. 1, $12; 2, $18; 3, $13; 4, $9; 5, $7.....50%
Millers Falls Adj. Tool H'dle, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior:
No. 1, $7.50; No. 2 $4.00; No. 3, $5.50.....30&10@30&10&10%

Garden Tool Sets—

Ft. Madison Rakes, Shovel and Hoe.... ₱ doz.....$9.00

Nail—

Square.....*per gro. $2 50*
Round, Blk. and Pol., assorted.... gro. $1.80@2.50
Octagon.....*gro. $4.25@4.75*
Knurled, Good.....*gro. $3.00@3.50*
Buck Brothers..... 27½%
Cannon's Diamond Point, ₱ gr. $12.. 25%
Mayhew's.....per gro. $9.00
Snell's Corrugated, Cup Pt. ..per gro. $7.50
Snell's Knurled, Cup Pt....per gro $7.50

Rivet—

Regular list.....70@70¢10¢5%

Saw—

Aiken's:
Genuine.....₱ doz. $5.50@6.00
Imitation .....₱ doz. $3.00@3.13
Atkin's.:
Criterion..... 40%
Adjustable..... 40%
Bemis & Call Co's.:
Cross Cut..... 30%
Hammer, new Pat..... 45%
Plate..... 20%
Spring Hammer..... 30%
Disston's Star and Monarch..... 25%
Morrill's No. 1, $15.00.....40&20%
Nos. 3 and 4, Cross Cut, $23.....50&20&5%
No. 5, Mill, $31.00.....50& 10& 10%
No. 10, $15.50..... 40&20%
No. 11, $16.00..... 40&20%
Taintor Positive, ₱ doz. $18..... 60%

Sharpeners, Knife—

Chicago Wheel & Mfg. Co..... 65%
Smith & Hemenway Co..... 70&5%
Tanite Mills ₱ gross, $14.40.....25@33⅓%

Sharpeners, Skate—

Eureka Skate Sharpener.... ₱ doz. $2.00

Shaves, Spoke—

Iron.....*doz. $1.00@1.25*
Wood.....*doz. $1.75@2.00*
Bailey's (Stanley R. & L. Co.).....50&10%
Goodell's, ₱ doz. $9.00..... 15&10%

Shears—

Cast Iron...	*7*	*8*	*9 in.*
Best	$16.00	13.00	20.00 gro
Good	$13.00	15.00	17 00 gro.
Cheap	$7.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality, Jap.....70@70¢10%
" *Nickel*.....60@60¢10%
Fair qual. Jap.....80@80¢5%
" *Nickel*.....75@75¢10%
Tailors' Shears.....40@40¢10%
Acme Cast Shears.....40@40&5%
Heinisch's Tailors' Shears..... 40%
Wilkinson's Hedge..... 50%
Wilkinson's Sheep.....1900 list. 50%

Tinners' Snips—

Steel Blades.....20¢10%
Steel Laid Blades.....40¢10%
Forged Handles, Steel Blades, Berlin.... 40&10&10%
Jennings & Griffin Mfg. Co's. 7 to 10 inch..... 50%
Niagara Snips..... 40%
P. S. & W. Co..... 20%

Pruning Shears and Tools—

Cronk's Grape Shears..... 33⅓%
Cronk's Pruning Shears..... 33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00.....25@25&10%
Disston's Pruning Hook, ₱ doz. $12.00 .....25@25&10%
John T. Henry Mfg. Company:
Pruning Shears, all grades..40@40&5%
Orange Shears.....50&10@50&20%
Grape .....40&10@50%
Tree Pruners..... 75%
Nagley's Pruning Shears.....10&5%
P., S. & W. Co..... 33⅓%

Sheaves—Sliding Door—

Stowell's Anti-Friction..... 50%
Patent Roller Hatfield's, Sargent's list, 75&10&10%
Reading..... 70&10@75%
R. & E. list..... 33⅓%
Wrightsville, Hatfield Pattern..... 80%

Sliding Shutter—

Reading list.....70&10@75%
R. & E. list..... 33⅓%
Sargent's list.....50&10&5&10%

Shells— Shells, Empty—

Brass Shells, Empty:
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge.. 65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Smokeless 10, 12, 16 and 20 gauge. 33⅓&10%
Blue Rival, New Climax, Primrose Club, Yellow Rival, 10, 12, 16 and 20 gauge..... 15%
Climax Club, League, Rival, 14, 16 and 20 gauge ($7.50 list).....20&5%
Climax Club, League, Rival 10 and 12 gauge..... 25&5%
Defiance, High Base, New Victor, Nitro, Repeater, 10, 12 16 and 20 gauge..... 15%
Trap and Metal Lined, 10, 12, 16 and 20 gauge..... 33⅓&10&5%

Shells, Loaded—

Loaded with Black Powder....40¢5%
Loaded with Smokeless Powder, medium grade..... 40¢10&5%
Loaded with Smokeless Powder, high grade. .....40¢10¢10¢5%

Shoes, Horse, Mule, &c.—

F. o. b., Pittsburg.

Iron.....*per keg $3.50*
Steel.....*per keg 3.25*
Burden's, all sizes, ₱ keg..... $3.60

Shot—

Drop, up to B, 25-lb. bag.....$1.50
Drop, B and larger, per 25-lb. bag.. $1.75
Buck, 25-lb. bag.....$1.75
Chilled, 25 lb. bag.....$1.75
Dust Shot, 25-lb. bag.....$2.00
Markle's Chilled..... $1.75
Raymond Chilled..... $1.75

Shovels and Spades—

No. 2, Polished, Sq. or Rd. Point, D or L Handle:

	A1, 1st Grade.	*B2,* 2d Grade
Plain Back	$10 50	$9 50
Strap Back	9.90	9.00
Cleveland Pat'n	10.50	9.50

	C3, 3d Grade.	*D4,* 4th Grade
Plain Back	$9.70	$8.10
Strap Back	8.10	7.50
Cleveland Pat'n	8.50	7.80

All other sizes add 30c doz.
Black deduct 30c doz.

Note.—The above are the regular Association prices but are often shaded by

Jobbers $0.50@1.00, and Common, Plain Back Shovels are generally sold by jobbers at about $7.00.

Sieves and Sifters—

Hunter's Imitation, gro. $11.00@11.50

Buffalo Metallic Blued, S. S. & Co., ₱ gr.:

14&16	16&18	18&20
$12.90	$13.80	$15.00

F. J. Meyers' Mfg. Co.:

Eclipse, ₱ gr. $11.00
Electric Light, ₱ gr. $11.00
Hunter's Genuine, ₱ gr. $12.50
No Name, Hunter's, ₱ gr. $11.00
Standard, ₱ gr. $11.00
Shaker (Barler's Pat.) Flour Sifters, ₱ doz., $2.00 .30¢

Sieves, Tin Rim—

Per dozen

Mesh	14	16	18	20
Black, full size	$0 95	.98	1.00	1.10
Plated, full size	$1.05	1 08	1.10	1.20
Black, scant		$0.78	.80	.83

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.

Mesh 18, Nested, doz. ..$0.65@0 75
Mesh 20, Nested, doz. ..75@ .85
Mesh 24, Nested, doz. ..90@1.00

Sinks—

Cast Iron—

Standard list ..65¢&10@70..%

NOTE.—*There is not entire uniformity lists used by jobbers.*

Wrought Steel—

New Era, Galv'd and Enameled..70&5%
New Era, Painted ..50&10%
L. & G. Mfg. Co., Galvanized..50%
L. & G. Mfg. Co. Enameled..50%

Skeins, Wagon—

Cast Iron ..70¢10@75%
Malleable Iron ..40¢10@50%
Steel ..40@40&10%

Slates—

Factory Shipments.

"D" Slates ..50¢10¢10¢10%
Unexcelled, etc., Noiseless Slates..60¢ & 8 tens %
Victoria, etc., Noiseless Slates..60¢ 7 tens &5%
Wire Bound ..50¢10¢5%
Web Hinge ..50%

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling $ 2.00 ..83⅓

Snaps, Harness—

German ..40@40¢10%

Covert Mfg. Co.:

Derby ..35&2½
High Grade ..45&2½
Jockey ..40&2½
Trojan ..45&2½
Yankee ..55&2½
Yankee, Roller ..30&2½

Covert's Saddlery Works:

Crown ..60%
German ..60%
Model ..60%
Triumph ..60%

W. & E. T. Fitch Co.:

Bristol ..40&10%
Empire ..50&5%
German ..40%
National ..50&5%
Perfect ..40%
Clipper ..60&5%
Champion ..40%
Security ..40%
Victor ..60&5%

Oneida Community:

Solid Steel ..65@65& 0%
Solid Swivel ..65&10@65&10&10%

Sargent's Patent Guarded ..60½&10%

Snaths—

Scythe ..50@50&10%

Snips, Tinners'—See *Shears.*

Soldering Irons—

See *Irons, Soldering.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Silver Plated—

Good Quality ..50¢10@60¢10¢5%
Cheap ..60@60¢10%

International Silver Co.:

1847 Rogers Bros. and Rogers & Hamilton ..40&10%
Rogers & Bro., William Rogers Eagle Brand ..50&10%
Anchor, Rogers Brand ..60%
Wm. Rogers & Son ..60&10%

Simeon L. & Geo. H. Rogers Co.:

Silver Plated Flat Ware ..60%
No. 77 Silver Plated Ware ..60&10%

Miscellaneous—

German Silver ..60¢10@60¢10¢10%

Simeon L. & Geo. H. Rogers Co.:

German or Nickel Silver, Special list 1 &10%

Tinned Iron—

Teas ..*per gro. 45@50c*
Tables ..*per gro. 90c@$1.00*

Springs—

Door—

Gem (Coil) ..20%
Star (Coil) ..30%
Torrey's Red, 39 in. ₱ doz. $1.10@1.25
Victor (Coil) ..50&10&10%

Carriage, Wagon, &c.

1¼ in. and Wider:

Black or ⅛ Bright, lb ..4¼c
Bright, lb ..5¼c

Painted Seat Springs:

1½ x 2 x 26 and smaller, per pr 50@55c
1½ x 2 x 28 per pr ..*58@63c*
1½ x 3 x 28 and narrower, per pr ..*80@85c*

Cliff's Springs:

Bolster ..40%
Seat ..per pair 50¢
Pole, per pair, ¾ in. $1.10; ⅞ in. $1.25

Sprinklers, Lawn—

Enterprise ..25@20%
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24 ..30%

Squares—

Nickel plated ..
Steel and Iron .. } *List Jan. 5, 1900*
Rosewood Hdl Try Square and T-Bevels ..60¢10¢10@70%
Iron Hdl. Try Squares and T-Bevels, ..40¢10@40¢10¢10%

Disston's Try Sq. and T-Bevels ..60&10%
Winterbottom's Try and Miter ..50&10%

Squeezers—

Lemon—

Wood, Common, gro., No. 0. $5.25 @5.50; No. 1, $6.25@6.50.
Wood, Porcelain Lined:
Cheap ..*doz. $2.00@2.75*
Good Grade ..*doz. $3.00@3.50*
Tinned Iron ..*doz. $0.75@1.25*
Iron, Porcelain Lined doz. $2.90@3.25
Jennings' Star ..₱ doz. $1.85@1.90

Staples—

Barbed Blind ..*lb. 6@6½c*
Electricians', Association list ..80¢10¢10%
Fence Staples, same price as Barbed Wire. See Trade Report.
Poultry Netting, Staples ..*per lb.* ..5¼@5½c

Grand Crossing Tack Co.'s list ..80&10%

Steels, Butchers'—

Dick's ..30%
Foster Bros' ..30%
Hartzell Cutlery Co ..40&5%
C. & A. Hoffmann's ..40%

Steelyards ..25@25¢10%

Stocks and Dies—

Blacksmiths' ..40@40¢10%
Gardner Die Stocks No. 1 ..50%
Gardner Die Stocks, larger sizes ..40%
Green River ..25%
Lightning Screw Plate ..25%
Little Giant ..25%
Reece's New Screw Plates ..25@30%
Curtis Reversible Ratchet Die Stock..25%

Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co.:

Gem Corundum, ½ inch, $3.00 per gro., 12 inch, $10.

Pike Mfg. Co. 1901 list:

Black Diamond S. S. ..₱ gro. $12.00
Lamoille S. S. ..₱ gro. $11.00
White Mountain S. S. ..₱ gro. $9.00
Green Mountain S. S. ..₱ gro. $6.00
Extra Indian Pond S. S. ..₱ gro. $7.50
No. 1 Indian Pond S. S. ..₱ gro. $7.00
No. 2 Indian Pond S. S. ..₱ gro. $4.50
Leader Red End S. S. ..₱ gro. $4.50
Balance of 1901 list 33⅓%

Oil Stones, &c.

Chicago Wheel & Mfg. Co., 1901 list:

Gem Corundum Oil, Double Grit ..50%
Gem Corundum Axe, Single or Double Grit ..55%
Gem Corundum Slips ..55%
Gem Corundum Razor Hones ..50%

Pike Mfg. Co. 1901 list:

	₱ lb.
Arkansas Stone, No. 1, 3 to 5½ in.	$2.80
Arkansas Stone, No. 1, 5½ to 8 in.	$3.50
Arkansas Slips No. 1	$4.00
Lily White Washita, 4 to 8 in	.60¢
Rosy Red Washita, 4 to 8 in	.60¢
Washita Stone, Extra, 4 to 8 in.	.50¢
Washita Stone, No. 1, 4 to 8 in.	.40¢
Washita Stone, No. 2, 4 to 8 in.	.30¢
Lily White Slips	.90¢
Rosy Red Slips	.90¢
Washita Slips, Extra	.80¢
Washita Slips, No. 1	.70¢

25%

India Oil Stones (entire list) ..25%

Hindostan No. 1, Regular	₱ lb 90¢
Hindostan No. 18 small	₱ lb 10¢

33⅓%

Axe Stones (all kinds) ..33⅓%

Turkey Oil Stones, ex. 5 to 8 in.	₱ lb 80¢
Queer Creek Stones, 4 to 8 in.	.30¢
Queer Creek Slips	.90¢
Sand Stone	.50¢

33⅓%

Belgian, German and Swaty Razor Hones ..40%

Natural Grit Carving Knife Hones,	₱ doz. $3.00
Quick Edge Pocket Knife Hones,	₱ doz. $2.40
Mounted Kitchen Sand Stone,	₱ doz. $1.50

33⅓%

Tanite Mills:

Emery Oil, ₱ doz. $5.00 ..50@60%

Stoners—

Cherry—

Enterprise ..25@30%

Stops, Bench—

Millers Falls ..15&10%
Morrill's ..₱ doz., No. 1, $10.00..50&10%
Morrill's, No. 2, $11.00 ..50&10%

Stops, Window—

Ives' Patent ..25&5%

Stove Boards—

See *Boards, Stove.*

Stove Polish—See *Polish, Stove.*

Strainers, Pump—

Diamond Joe Pump Strainers..per doz. $

Straps, Box—

Cary's Universal case lots ..20&10%

Stretchers, Carpet—

Cast Iron, Steel Points ..*doz. 55@65c*
Socket ..*doz. $1.75*

Strops, Razor—

Smith & Hemenway Co ..70%

Stuffers, Sausage—

Enterprise Mfg. Co ..25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97 ..30%

Tacks Brads, &c.—

List Jan. 15, '99.

Carpet Tacks, American 90¢25@..%
American Cut Tacks ..90¢20@..%
Swedes Iron Tacks ..90¢30@..%
Swedes Upholsterers' Tacks ..90¢10@..%
Gimp Tacks ..90¢10@..%
Lace Tacks ..90¢10@..%
Trimmers' Tacks ..90¢25@..%
Looking Glass Tacks ..70¢10%
Bill Posters' and Railroad Tack ..90¢10@..%
Hungarian Nails ..80¢15%
Common and Patent Brads ..80¢10%
Trunk and Clout Nails ..80¢5%

NOTE.—*The above prices are for Straight Weights.* *An extra 5% is given Star Weights* and *an extra 10&5% on Standard Weights.*

Miscellaneous—

Double Point Tacks ..90¢5 or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list ..50¢10@60%

See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co ..30-gal. $3.20
Emerald, S. S. & Co ..60-gal. $4 00
Queen City S. S. & Co., 0-gal ..$3.50
Queen City S. S. & Co., 60-gal ..$4.25

Tapes, Measuring—

American Asses' Skin ..40¢10@50%
Patent Leather ..25@30¢5%
Steel ..10@40¢5%
Chesterman's ..25@25¢5%
Eddy's Steel ..40@40&5%
Eddy's Metallic ..33⅓@33⅓&5%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899 ..33%
Lufkin's Steel ..33⅓@35%
Lufkin's Metallic ..30@30&5%

Teeth Harrow—

Steel Harrow Teeth, plain or headed, bas; per lb ..2¼c

Thermometers—

Tin Case ..80¢10@90¢10¢5%

Ties, Bale—Steel.

Standard Wire ..50¢10¢5%

Ties, Wall—

Cleveland Wire Spring Co.:

Galv. Steel 5-32 x 6½ in. ₱ 1000..$10.00
Galv. Steel 5-32 x 8½ in. ₱ 1000..$11.00
Galv. Steel 5-32 x 11½ in. ₱ 1000 $12.00
Galv. Steel 5-32 x 15½ in. ₱ 1000 $14.00

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

L. & I. J. White ..20@20&5%

Saw—

Atkins' Cross Cut Saw Tools ..40%
Simonds' Improved ..33⅓%
Simonds' Crescent ..25%

Ship—

L. & I. J. White ..25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme ..doz. $1.15@1.25; gro. $10.50@11.00
Harper, Champion or Paragon ..doz. $1.25@1.40; gro. $12.00@12 50

Game—

Oneida Pattern ..75¢10¢5@30¢5%
Newhouse ..45@45&5%
Hawley & Norton ..65&5@65&10%
Victor (Oneida Pattern) ..75@75&5%
Star (Blake Pattern) ..60&5@60&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes ..8½@9c
Mouse, Round or Square Wire ..doz. $0.85@1.00

American Pattern French Rat and Mouse Traps—

No. 1, Detroit Marty Pattern, ₱ doz. $4.50; in ⅛ gro. lots, ₱ doz. ..$4.00
No. 2, Detroit Marty Pattern, ₱ doz. $3.25; in ⅛ gro. lots, ₱ doz. ..$3.00
Detroit Marty Pattern Mouse, ₱ doz. $2.00; in ⅛ gro. lots, ₱ doz. ..$1.75
Diamond Joe Mouse Traps ..per doz. 60¢
Diamond Joe Rat Traps ..per doz. $1.00
Marty French Rat and Mouse Traps (Genuine)—
No. 1, Rat, Each $1.12½; ₱ doz. $12.00
No. 3, Rat, ₱ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat, ₱ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₱ doz. $3.50; case of 72 $2.75 doz.
No. 5, Mouse, ₱ doz. $2.75; case of 150 $2.25
Schuyler's Rat Killer, No. 1, ₱ gr. $30.00; No. 2, ₱ gr. $30.00; Mouse, No. 3, $18.00 ..50%

Target—

Markle's, each ..$5.50

Trimmers, Spoke—

Bonney's Nos. 1 and 2 ..40%

Trowels—

Disston Brick and Pointing ..30%
Disston Plastering ..25%
Disston "Standard Brand" and Garden Trowels ..40%
Never-Break Steel Garden Trowels ..gro. $7.00
Peace's Plastering ..30%
Rose Brick and Plastering ..25&5%
Woodrough & McParlin, Plastering ..25%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list ..50%
Daisy Stove Trucks, Improved pattern ₱ doz. $18.50
Model Stove Trucks ..₱ doz. $18.50

Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	*$5.00*	*5 50*	*6.00*

Galvanized Wash Tubs (S. S. & Co.):

No.	1	2	3	10	20	30
Per doz.	$5 25	6.00	6.75	6.50	7 25	8.00

Twine—

Miscellaneous—

Flax Twine—	*BC*	*B.*
No. 9, ¼ and ½-lb. Balls	*22c*	*21c*
No. 12, ¼ and ½-lb. balls	*18c*	*20c*
No. 18, ¼ and ½-lb. Balls	*16c*	*18c*
No. 24, ¼ and ½-lb. Balls	*15½c*	*17½c*
No. 36, ¼ and ½-lb. Balls	*15c*	*17c*
Chalk Line, Cotton, ½-lb Balls		*22@23½c*
Cotton Mops, 6, 9, 12 and 15 lb. to doz		*7@8c*
Cotton Wrapping, 5 Balls to lb according to quality		*10½c@12c*
American 2-Ply Hemp, ¼ and ½-lb. Balls		*13@14c*
American 3 Ply Hemp, 1-lb. Balls		*13@14c*
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)		*9c*
India 2-Ply Hemp, 1-lb. Balls		*8c*
India 3-Ply Hemp, 1½-lb. Balls		*8c*
2, 3, 4 and 5-Ply Jute, ½-lb. Balls		*2½@10c*
Mason Line, Linen, ½-lb. Balls		*15c*
No. 265 Mattress, ¼ and ½-lb. Balls		*37c*
Wool, 3 to 6 ply		*5½c*

Vises—

Solid Box ..50@50&10%

Parallel—

Athol Machine Co.:

Simpson's Adjustable ..40%
Standard ..40%
Amateur ..25%

Bonney's ..40%
Columbian Hdw. Co ..40%
Fisher & Norris Double Screw ..15&10%

Hollands':

Machinists' ..40%
Key-tone ..65&5%

Lewis Tool Co ..20@30%
Massey's Perfect ..15@20%

Massey's:

Clincher ..30@40%
Combination, Quick Adj ..40%
Woodworker's ..15@20%

Merrill's ..20%
Miller's Falls ..50&10&10%

Parker's:

Victor ..20@25%
Regulars ..20@25%
Vulcan's ..40@45%
Combination Pipe ..55@60%

Prentiss ..20@25%
Sargent's ..40%
Snedliker's X. L ..30@25%
Stephens' ..20@25%

Saw Filers—

Bonney's, No. 1, $15; No. 3, $16 ..50%
Disston's D 3 Clamp and Guide, ₱ doz. $30 ..25%
Reading ..40%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3 ..45&50%

Miscellaneous—

Bignall & Keeler Combination Pipe Vise ..40%

Parker's Combination Pipe:

87 Series ..60%
187 Sereis ..60&5%
No. 870 ..40%

Wads—Price Per M.

B. E., 11 up	*.60c*
B. E., 9 and 10	*.70c*
B. E., 8	*.80c*
B. E., 7	*.80c*
P. E., 11 up	*$1.00*
P. E., 9 and 10	*1.25*
P. E., 8	*1.50*
P. E., 7	*1.50*
Ely's B E., 11 and larger	*$1.70@1.75*
Ely's P. E., 12 to 20	*$3 00@3.25*

Discount 50&5%

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Aluminum—

S. S. & Co. Reduced List ..40%

Cast Iron, Hollow—

Stove Hollow Ware:
Ground ..50%
Unground ..70%
White Enameled Ware:
Maslin Kettles ..75¢10¢5@80%
Covered Ware:
Tinned and Turned ..40¢10@40¢10¢5%
Enameled and Plain ..50@50¢10¢5%

See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware, list Nov. 1, '01 ..50&5%
Iron Clad Ware ..70&10%
Never Break Enameled ..50&5@50&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*.45c*	*.50c*	*.55c*	*.65c*

Steel Hollow Ware.

Avery Spiders & Griddles ..65&65&5%
Avery Kettles ..90%
Porcelained ..50&5@50&10%
Never Break Spiders and Griddles ..65&5%
Never Break Kettles ..60%
Solid Steel Spiders & Griddles ..65&5%
Solid Steel Kettles ..90%
Solid Steel Ware, Enameled ..50&5%

Washboards—

Solid Zinc: ₱ doz

Crescent, family size, bent frame..$3.00
Red Star, family size, stationary protector ..$3.00

Double Zinc Surface:

Saginaw Globe, family size, stationary protector ..$2.65
Cable Cross, family size, stationary protector ..$2.90

Single Zinc Surface:

Naiad, family size, open back perforated ..$3.40
Saginaw Globe, protector, family size, ventilated back ..$2.25

Brass Surface:
Brass King, Single Surface, open back $3.00
Nickel Plate Surface:
No. 1901 Nickel Plate, Single Surface $3.00

Washers—
Leather, Axle—
Solid, ...85c 10c 10@85c 10c 10c 10%
Patent ..... 85c 10@85c 20%
Coil: 3/8 1 1 1/4 1 1/4 Inch.
10c 11c 14c 18c per 100

Iron or Steel
Size bolt ... 5-16 3/8 1/2 5/8 3/4
Washers....$5.10 4.30 2.90 2.10 2.50
In lots less than one keg add 1/4c per lb., 5-lb. boxes add 1/2c to list.

Cast Washers—
Over 1/4 inch, barrel lots, per lb..... 1 1/4@1 1/4c

Washer Cutters—
See *Cutters, Washer.*

Washing Machines—
See *Machines, Washing.*

Water Coolers—
See *Coolers, Water.*

Wedges—
Oil Finish ..... lb. 2.90@3.10c

Weights, Sash
Per ton, f.o.b. factory ....$21.00@22.00

Some Foundries make price $1@$2 lower.

Well Buckets, Galvanized
See *Pails, Galvanized.*

Wheels Well—
8-in., $1.45@1.65; 10-in., $1.75@2.00; 12-in., $2.35@2.50; 14-in., $3.50@3.75

Wire and Wire Goods—
Bright and Annealed:
6 to 9 ..... 72 1/2 c 5@72 1/2 c 10%
10 to 18 ..... 72 1/2 c 10@72 1/2 c 10 c 5%
19 to 26 ..... 75c 10c 2 1/2 @75c 10c 17 1/2 %
27 to 36 ..... 75c 10c 17 1/2 @80c 2 1/2 %
Galvanized:
6 to 18 ..... 70@70c 5%
19 to 26 ..... 72 1/2 c 5@72 1/2 c 10%
27 to 36 ..... 72 1/2 c 10@72 1/2 c 10c 5%
Coppered:
6 to 9 ..... 70c 5@70c 10%
10 to 18 ..... 70c 10@70c 10c 5%
19 to 26 ..... 75c 17 1/2 @75c 10c 2 1/2 %
27 to 36 ..... 75c 10@75c 10c 5%
Tinned:
6 to 14 ..... 75@75c 17 1/2 %
15 to 18 ..... 72 1/2 c 17 1/2 %
19 to 26 ..... 70c 5@70c 5c 5%
27 to 36 ..... 70@70c 5%
Annealed Wire on Spools ..70c 5@70c 10%
Brass and Copper Wire on Spools .. 60c 5@50c 10%
Brass, list Feb. 26, '96 ..... 25%
Copper, list Feb. 26, '96 ..... 15%
Cast Steel Wire 50%
Stubs' Steel Wire ..... $6.00 to $. 40%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

Bright Wire Goods—
List April 1, 1901 ..... 85c 10@...%

Wire Cloth and Netting—
Galvanized Wire Netting ..80c 20@...%
Painted Screen Cloth per 100 ft ..$1.00
Light Hardware Grade:
2-18 Mesh, Plain (8c. list) sq. ft... 1 1/4@1 1/4c
2-18 Mesh, Galv. (8c. list) sq. ft... 2 1/2@2 3/4c

Wire, Barb—See *Trade Report.*

Wire Rope—See *Rope, Wire.*

Wrenches—
Agricultural ..... 70c 10@75c 10%
Case lots 75c 10%
Acme ..... 60& 10%
Alligator 70%
Baxter's S ..... 60& 10%
Bull Dog 70%
Bemis & Call's:
Adjustable S ..... 35& 5%
Adjustable S Pipe 40%
Brigg's Pattern ..... 30& 10%
Combination Black ..... 40& 5%
Combination Bright 40%
Cylinder or Gas Pipe 55%
Extra Heavy 45%
Merrick's Pattern 50%
No. 3 Pipe, Bright 55%
Bindley Automatic 80%
Boardman's ..... 33 1/3 %
Coes' Genuine ..... 40& 10& 5& 5%
Coes' "Mechanics' ..... 40& 10& 10& 5& 5%
Donohue's Engineer ..... 40& 10%
Eagle ..... 50& 10%
Elgin Wrenches 40%
Elgin Monkey Wrench Pipe Jaws .. 33 1/3 %
Gem Pocket 30%
Hercules 70%
Knife Handle, Machinists' (W. & B.):
Case lots ..... 60& 10%
Less than case lots ..... 50& 5%
Improved Pipe (W. & B.) 60%
Solid Handles, P. S. & W. ..... 50@50& 10%
Triumph ..... 60& 10%

Wrought Goods—
Staples, Hooks, &c., list March 17 '92 ..... 90@90c 10%

Yokes Neck—
Covert Saddlery Works, Trimmed .60& 35
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters' .. list net

Zinc—
Sheet ..... lb 6 1/4c@6 3/4c

PAINTS, OILS AND COLORS—Wholesale Prices.

White Lead, Zinc, &c.
Lead, English white, in Oil ..... @ 9 1/4
Lead, American White, in Oil:
Lots of 500 lb or over ..... @ 6 1/4
Lots less than 500 lb ..... @ 7
Lead, White, in oil, 25 lb tin pails, add to keg price ..... @ 1/4
Lead, White, in oil, 12 1/2 lb tin pails, add to keg price ..... @ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price ..... @ 1 1/4
Lead White, Dry in bbls ..... 5 1/4@ 6
Lead, American. Terms: On lots of 500 lbs. and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.
Zinc, American, dry ..... ₩ lb 4 1/2@ 4 1/2
Zinc, Paris, Red Seal, dry ..... @ 8 1/2
Zinc, Paris, Green Seal, dry ..... @ 9 1/2
Zinc, Antwerp Red Seal, dry ..... @ 6 1/2
Zinc, Antwerp, Green Seal, dry ..... @ 8
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over ..... 12 @12 1/2
Lots of less than 1 ton ..... 12 1/2@12 1/2
Zinc, V. M French, in Poppy Oil, Red Seal:
Lots of 1 ton and over ..... 10 1/2@11 1/2
Lots of less than 1 ton ..... 11@11 1/2
DISCOUNTS.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors.
Black, Carbon ..... ₩ lb 8 @30
Black, Drop, Amer ..... 4 @ 7
Black, Drop, Eng ..... 7 @11
Black, Ivory ..... 12 @21
Lamp, Com ..... 4 1/2@ 6
Blue, Celestial ..... ₩ lb 4 @ 6
Blue, Chinese ..... 80 @95
Blue, Prussian ..... 28 @34
Blue, Ultramarine ..... 4 @20
Brown, Spanish ..... 1/2@ 1
Brown, Vandyke, Amer ..... 1 1/2@ 2 1/4
Brown, Vandyke, Foreign ..... 2 1/2@ 3 1/2
Carmine, No. 40 ..... ₩ lb $2.05@$2.75
Green, Chrome, ordinary ..... 5 @ 6 1/2
Green, Chrome, pure ..... 16 @20
Lead, Red, bbls. 1/2 bbls. and kegs:
Lots 500 lb or over ..... @ 6
Lots less than 500 lb ..... @ 6 1/4
Litharge, bbls. 1/2 bbls. and kegs:
Lots 500 lb or over ..... @ 6
Lots less than 500 lb ..... @ 6 1/4
Ocher, French Washed ..... 1 1/2@ 1 1/2
Ocher, Dutch Washed ..... 4 1/2@ 5
Ocher, American ... ₩ ton $10.00@15.00
Orange Mineral, English .. ₩ lb 8 @11 1/2
Orange Mineral, French ..... 11 3-16@11 1/2
Orange Mineral, German ..... 8 @10 1/2
Orange Mineral, American ..... 8 @ 8 1/2
Red, Indian, English ..... 4 1/2@ 8 1/2
Red, Indian, American ..... 3 @ 3 1/2
Red, Turkey, English ..... 4 @ 6
Red, Tuscan, English ..... 7 @10
Red, Venetian, Amer. ₩ 100 lb. 80@1.75
Red Venetian, English, ₩ 100 lb 1.80@3.00
Sienna, Italian, Burnt and Powdered ..... ₩ lb 3 1/2@ 7 1/2
Sienna, Ital., Raw, Powd ..... 3 1/2@ 7 1/2
Sienna, American, Raw ..... 1 1/2@ 2
Sienna, American, Burnt and Powdered ..... ₩ lb 1 1/2@ 2
Tale, French ..... ₩ 100 lb $1.25@1.50
Talc, American ..... .90 @1.10
Terra Alba, French, ₩ 100 lb .95 @1.00
Terra Alba, English ..... 95 @1.00
Terra Alba, American No. 1 ..... 65 @85
Terra Alba, American No. 2 ..... 45 @50
Umber, Turkey, Bnt. & Pow. ₩ lb 2 1/2@ 3 1/2
Umber, Turkey, Raw & Powd. 2 1/2@ 3 1/2
Umber, Bnt. Amer ..... 1 1/2@ 2
Umber, Raw, Amer ..... 1 1/2@ 2
Yellow, Chrome ..... 10 1/2@25
Vermilion, American Lead ..... 10 @40
Vermilion, Quicksilver, bulk ... @70
Vermilion, Quicksilver, bags ... @71
Vermilion, English, Import .. 80 @95
Vermilion, Chinese ..... $1.05@1.20

Colors in Oil.
Black, Lampblack ..... 12 @14
Blue, Chinese ..... 36 @40
Blue, Prussian ..... 32 @36
Blue, Ultramarine ..... 13 @16
Brown, Vandyke ..... 9 1/2@13
Green, Chrome ..... 10 @12
Green, Paris ..... @24
Sienna, Raw ..... 10 @13
Sienna, Burnt ..... 10 @13
Umber, Raw ..... 9 1/2@12
Umber, Burnt ..... 9 1/2@12

Miscellaneous.
Barytes, Foreign, ₩ ton ....$19.00@21.00
Barytes, Amer. floated ..... 19.00@20.00
Barytes, Crude, No. 1 ..... 9.00@10.00
Chalk, in bulk ..... ₩ ton 2.50@ 2.60
Chalk, in bbls ..... ₩ 100 lb ...@ 35
China Clay, English .. ₩ ton 12.00@17.50
Cobalt, Oxide ..... ₩ 100 lb 2.25@ 2.50
Whiting, Common. ₩ 100 lb .40@ .60
Whiting, Gilders ..... .45@ .65
Whiting, extra Gilders' .... .55@ .88

Putty.
In bladders $2.45
In bulk 1.25
In cans 1 lb to 5 lb 3.25
In cans 12 lb to 25 lb 2.25

Spirits Turpentine.
In Southern bbls ..... 37 1/2@38 c
In machine bbls ..... 38 @38 1/2c

Glue.
Cabinet ..... 11 1/2@16
Extra White ..... 18 @23
French ..... 12 @40
Irish ..... 13 1/2@18
Low Grade ..... ₩ lb 9 @12
Medium White ..... 14 1/2@16 1/2

Animal, Fish and Vegetable Oils.
Linseed, City, raw ..... ₩ gal ... @53
Linseed, City, boiled ..... @57
Linseed, State and West'n, raw .50 @53
Linseed, raw Calcutta seed .... @55
Lard, Prime ..... 76 @...
Lard, Extra No. 1 ..... 52 @54
Lard, No. 1 ..... 45 @46
Cotton-seed, Crude ..... @...
Cotton-seed, Summer Yellow, prime ..... 36 1/2@37
Cotton-seed Summer Yellow, off grades ..... 35 @36
Sperm, Crude ..... @...
Sperm, Natural Spring ..... 80 @81
Sperm, Bleached Spring ..... 83 @85
Sperm, Natural Winter ..... 61 @63
Sperm, Bleached Winter ..... 65 @66
Tallow, Prime ..... 57 @58
Whale, Crude ..... @...
Whale, Natural Winter ..... 45 @46
Whale, Bleached Winter ..... 47 @48
Menhaden, Crude, Sound ..... @...
Menhaden, Light Strained .... 31 @32
Menhaden, Bleached Winter ..... @35
Menhaden, Ex Bleached Winter 36 @37
Cocoanut, Ceylon ..... 7 1/4@ 7 3/4
Cocoanut, Cochin ..... 7 3/4@ 8 1/4
Cod, Domestic ..... 33 @34
Cod, Newfoundland ..... 35 @36
Red Elaine ..... @42
Red Saponified ..... ₩ lb 6 @ 6 1/4
Olive, Italian, bbls ..... 58 @ 62
Neatsfoot, prime ..... 52 @53
Palm, prime, Lagos ..... ₩ lb 5 1/2@ 5 3/4

Mineral Oils.
Black, 20 gravity, 25@30 cold test ..... ₩ gal. 9 1/2@ 10 1/2
Black, 30 gravity, 15 cold test. 10 1/2@ 11 1/2
Black, summer ..... 9 1/2@ 9 1/2
Cylinder, light filtered ..... 14 1/2@17 1/2
Cylinder, dark filtered ..... 11 1/2@15 1/2
Paraffine, 903-907 gravity ..... 12 1/2@12 1/2
Paraffine, 903 gravity ..... 11 1/2@11 1/2
Paraffine, 883 gravity ..... 9 1/2@10
Paraffine, red, No. 1 ..... 12 1/2@12 1/2
In small lots 1/2c advance.

THE IRON AGE.

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CURRENT METAL PRICES.

DECEMBER 4, 1901.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron: Duty, Round, 0.6¢ ₩ lb; Square, 0.8¢ ₩ lb
1 to 1⅜ in. round and square ..... ₩ lb 1.90@2.00¢
1⅜ to 4 in. x ⅜ to 1 in. .....
Refined Iron:
1 to 1⅜ in. round and square..... ₩ lb 1.95@2.05¢
1⅜ to 4 in. x ⅛ to 1 in..... ₩ lb 2.05@2.15¢
1⅜ to 4 in. x ¼ to 5-16..... ₩ lb 2.25@2.35¢
Rods—⅜ and 11-16 round and square. ₩ lb
Angles: Cts ₩ lb
3 in. x ¼ in. and larger..... 2.50¢
3 to 3½ in. x 5-16 in..... 2.50¢
1¾ to 3 in. x ¼ in..... 2.50¢
1¾ to 2½ in. x 5-16 in and thicker..... 2.20@2.30¢
1 to 1¼ in. x 5-16 in..... 2.30@2.40¢
1 to 1¼ x ⅛ in..... 2.40@2.50¢
⅞ x ¼ in..... 2.60¢
¾ x ¼ in..... 2.75¢
⅝ x ¼ in..... 3.50¢
½ x 5-32 in..... 4.50¢
Tees:
1 in..... 2.80¢
1¼ in..... 2.60¢
1½ in. and larger..... 2.50¢
Beams..... 3.00¢
Channels, 3 in. and larger..... 3.00¢
Bands—1¼ to 6 x 3-16 to No. 8..... ₩ lb 2.30¢
"Burden's Best" iron, base price..... ₩ lb 3.15¢
Burden's "H. B & S. Iron, base price..... ₩ lb 2.95¢
"Ulster" ..... ₩ lb 3.60¢
Norway Bars..... $ 75@4.25¢
Norway Shapes..... 4.00@4.50¢

Merchant Steel from Store—

	Per lb
Bessemer Machinery.....	1.90 to 1.95¢
Toe Calk, Tire and Sleigh Shoe.....	2.00@2.50¢
Best Cast Steel, base price in small lots.....	7½¢
Best Cast Steel Machinery, base price in small lots.....	6 ¢

Soft Steel Sheets—

¼ inch.....	2.20¢	No. 14.....	3.00¢
5-16 inch.....	2.30¢	No. 16.....	3.20¢
No. 8.....	2.40¢	No. 18.....	3.40¢
No. 10.....	2.60¢	No. 20.....	3.70¢
No. 12.....	2.90¢	No. 22.....	3.80¢

Sheet Iron from Store.

Black.

	One Pass, C. R. Soft Steel.	R. G. Cleaned.
Nos. 14 to 16.....	₩ lb, 3.65.....	3.70¢
Nos. 18 to 21.....	₩ lb, 3.75.....	3.80¢
Nos. 22 to 24.....	₩ lb, 3.85.....	3.90¢
Nos. 25 and 26.....	₩ lb, 3.95.....	4.00¢
No. 27.....	₩ lb, 4.05.....	4.10¢
No. 28.....	₩ lb, 4.15.....	4.20¢

Russia, Planished, &c.

Genuine Russia, according to assortment..... ₩ lb 11@18¢
Patent Planished..... ₩ lb A, 12¢; B, 11¢, net.

Galvanized.

	R. R.
Nos. 10 to 16.....	₩ lb, 12¢
Nos. 17 to 21.....	₩ lb, 13¢
Nos. 22 to 24.....	₩ lb, 14¢
Nos. 25 to 26.....	₩ lb, 15¢
No. 27.....	₩ lb, 16¢
No. 28.....	₩ lb, 17¢
No. 29.....	₩ lb, 19¢
No. 30.....	₩ lb, 21¢

60@75% off

36 in. 1¢ ₩ lb higher.

Foreign Steel from Store—

Best Cast.....	₩ lb 15 ¢
Extra Cast.....	₩ lb 18 @ 20 ¢
Swaged, Cast.....	₩ lb 16 ¢
Best Double Shear.....	₩ lb 15 ¢
Blister, 1st quality.....	₩ lb 13 ¢
German Steel, Best.....	₩ lb 10 ¢
2d quality.....	₩ lb 9 ¢
3d quality.....	₩ lb 8 ¢
Sheet Cast Steel, 1st quality.....	₩ lb 15 ¢
2d quality.....	₩ lb 14 ¢
3d quality.....	₩ lb 12 ¢
R. Mushet's "Special"	₩ lb 46 ¢
" " Annealed	₩ lb 75 ¢
" " "Titanic"	₩ lb 19 ¢
Hobson's Choice XX Extra Best.....	₩ lb 35 ¢
Jessop Self Hardening.....	₩ lb 45 ¢
Seamans' "Nelson" Steel.....	40 ¢
Hobson's "Soho" Special Self-Hardening..	₩ lb 43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free.	Per lb
Banca, Pigs.....	28½@29 ¢
Straits, Pigs.....	28 @28½¢
Straits in Bars.....	29 @29½¢

Tin Plates—

American Charcoal Plates.

Calland Grade:
IC, 14 x 20..... $7.25
IX, 14 x 20..... 8.75
Melyn Grade:
IC, 14 x 20..... 6.75
IX, 14 x 20..... 8.25
Allaway Grade:
IC, 14 x 20..... 6.25
IX, 14 x 20..... 7.35

American Coke Plates—Bessemer—

IC, 14 x 20 .....108 lb..... $5.75@6.00
IX, 14 x 20..... 6.75@7.25

American Terne Plates—

IC, 20 x 28..... $11.00@11.25
IX, 20 x 28..... 13.00@13.25

Tin Boiler Plates, American—

XX, 14 x 28 .....112 sheets..... $13.00
XX, 14 x 28 .....112 sheets..... 14.00
XX, 14 x 31 .....112 sheets..... 15.50

Copper—

Duty: Pig, Bar and Ingot and Old Copper free Manufactured, 2½¢ ₩ lb.

Ingot—

Lake..... 17¼@17½¢
Ansonia grade Casting..... 16¾@17 ¢

Sheet and Bolt—

January 19, 1900. Net.

Prices, in cents per pound. Sheet 30 x 60.

Not wider than	Not longer than	And longer than	64 oz. & over, 50 lb, sheet, 30 x 60 and heavier.	32 oz. to 64 oz. 25 to 50 lb.	24 oz. to 32 oz. 18¾ to 25 lb.	16 oz. to 24 oz. 12½ to 18¾ lb.	14 oz. and 15 oz. 11 to 12½ lb.	13 oz. and 13 oz. 9⅞ to 11 lb.	10 oz. and 11 oz. 7¾ to 9⅛ lb.	8 oz. and 9 oz. 6¼ to 7⅛ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	21	21	21	21	22	23	24	27	30
30	96	72	21	21	21	21	22	24	27	30	
30	.....	96	21	21	21	21	23	27			
36	72	.....	21	21	21	23	23	25	28	31	
36	96	72	21	21	21	23	23	27	30		
36	120	96	21	21	21	23	24				
36	.....	120	21	21	22	23					
48	72	.....	21	21	22	23	25	28	31		
48	96	72	21	21	22	24	25	29			
48	120	96	21	21	23	25	29				
48	.....	120	21	22	24	27					
60	72	.....	21	20	22	24	27	32			
60	96	72	21	21	23	25	30				
60	120	96	21	22	24	27					
60	.....	120	21	23	25	29					
72	96	.....	21	22	24	29					
72	144	96	21	23	26	31					
72	.....	144	23	24	29						
108	120	.....	23	24	30						
108	.....	120	24	25							
wider than 108	144	.....	25	27							
	.....	144	25	29							

Rolled Round Copper, ⅜ inch diameter and over, ₩ lb 2¢.
Circles, Segments and Pattern Sheets, 3¢ ₩ lb advance over price of sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ lb over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ lb over the foregoing prices.
All Polished Copper, 20 in. wide and under, 1¢ ₩ lb advance over the price for Cold Rolled Copper.
All Polished Copper, over 20 in. wide, 3¢ ₩ lb advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ lb more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ lb.....	25¢
12 oz. and up to 14 oz. to square foot, ₩ lb.....	26¢
10 oz. and up to 12 oz., ₩ lb.....	27¢
Lighter than 10 oz., ₩ lb.....	31¢

Circles less than 8 in. diameter, 2¢ ₩ lb additional.
Circles over 18 in. diameter are not classed as Copper Bottoms.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.
Last March 2, 1900.

Nos...0000 to 8	9 and 10		11 and 12
Base	½¢		½¢ ₩ lb adv.
Nos..... 13	14	15	16
½¢	¾¢	1¢	1½¢ ₩ lb adv.
Nos..... 17	18	19	20
1½¢	2¢	2½¢	2½¢ ₩ lb adv.

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.
Feb. 6, 1899. Net. Outside Diameter.

Stubs' W. G.	B. & S. W. G.	⅛	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-0	2-0	.....	.....	.....	.....	33	31	30	29	28	27	25	24
0	1	.....	.....	37	35	33	31	30	29	28	27	25	24
1	2	.....	.....	37	35	33	31	30	29	28	27	25	24
2	3	.....	41	37	35	33	31	30	29	28	27	25	24
3	4	.....	42	38	36	33	32	31	30	30	28	26	25
4	5	.....	43	39	37	34	33	32	31	30	29	26	25
5	6	.....	44	40	38	35	34	33	32	31	30	27	26
6	7	46	45	42	39	36	35	34	33	32	30	28	27
7	8	50	47	44	40	37	36	35	34	33	32	30	29
8	9	54	49	46	42	39	38	37	36	35	34	32	31
9	10	58	52	48	43	41	40	39	38	37	36	35	34
10	11	62	55	50	45	43	42	41	40	39	38	37	36
11	12	66	58	52	47	45	44	43	42	41	40	39	38
12	13	70	61	54	49	47	46	45	44	43	42	41	40
13	14	74	64	56	51	49	48	47	46	45	44	43	42
14	15	78	67	58	53	51	50	49	48	47	46	45	44
15	16	82	70	60	55	53	52	51	50	49	48	47	46
16	17	86	73	62	57	55	54	53	52	51	50	49	48
17	18	90	76	64	59	57	56	55	54	53	52	51	50
18	19	94	79	66	61	59	58	57	56	55	54	53	52
19	20	98	82	68	63	61	60	59	58	57	56	55	54
20	21	102	85	70	65	63	62	61	60	59	58	57	56
21	22	106	88	72	67	65	64	63	62	61	60	59	58
22	23	110	91	74	69	67	66	65	64	63	62	61	60
23	24	114	94	76	71	69	68	67	66	65	64	63	62
24	25	118	97	78	73	71	70	69	68	67	66	65	64
25	26	122	100	80	75	73	72	71	70	69	68	67	66

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
36	32	30	27	21	21	21	21	21	21	21	23	23	25	27	28¢ ₩ lb

Copper, Bronze or Gilding Tubes, 3¢ ₩ lb additional

Brazed Brass Tubing.

(*To No. 19, inclusive.*) Feb. 26 1896
Brown & Sharpe's gauge standard.

	Per lb.
Plain Round Tube, ⅛ in. up to 2 in.....	$0.35
" " ¼ " " 2 "	.36
" " ⅜ " " 2 "	.38
" " ½ " " 2 "	.41
" " 5-16 " " 2 "	.48
" " ¼ " 5-16"	.65
" " 3-16 " ¼ "	1.00
" " ¼ " 3-16"	1.50
Smaller than ¼ inch.....	Special
3 inch and larger.....	.40
Over 3 inch to 3½ inch, inclusive.....	.45
Over 3½ inch	.50

Bronze and Copper, advance on Brass List, 3 cents.
Discount from list 5..... 35%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass	In.	In.	In.	In.	In.	In.	In.	In.	In.
Wider than	2	12	14	16	18	20	22	24	
and including	12	14	16	18	20	22	24	26	
To No. 20 inclusive.	.22	.23	.25	.27	.29	.31	.33	.36	
Nos. 21 22, 23 and 24.	.22	.24	.26	.28	.30	.32	.34	.37	
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38	
Nos. 27 and 28	.23	.25	.28	.30	.32	.34	.36	.39	

Common High Brass	In.	In.	In.	In.	In.	In.	In.	In.
Wider than	26	28	30	32	34	36	38	40
and including	28	30	32	34	36	38	40	
To No. 20, inclusive...	.39	.42	.46	.50	.55	.60	.65	*
Nos. 21, 22, 23 and 24.	.40	.43	.47	.51	.56	.61	.68	
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75	

* Special prices not less than 80 cents.
Add ½¢ ₩ lb additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List..... 20%

Wire in Coils. List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gilt & bronze and copper
All Nos. to No. 10, inclusive....	$0.23	$0.27	$0.28
Above No. 10 to No. 16.....	.23½	.27½	.28½
No. 17 and No. 18.....	.24	.28	.32
No. 19 and No. 20.....	.25	.29	.33
No. 21	.26	.30	.34
No. 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.59
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 20%; Copper Wire, Net. List November 16, '96.
Spring Wire, 2¢ ₩ lb advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ lb, net..... 30¢
Finished Piston Rods, ⅝ to 2½ in. diameter, ₩ lb net. 31¢
Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ lb
Western Spelter..... 4½@4.60¢

Zinc.

Duty: Sheet, 2¢ ₩ lb.
600 lb casks..... 6¾¢ | Per lb..... 7¾¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.

American Pig.....	4.62½@4½¢
Bar.....	5¼@5¾¢
Pipe.....	6¾¢..... 20% off
Tin Lined Pipe.....	12½¢..... 20% off
Block Tin Pipe.....	37½¢..... 20% off
Sheet Lead, full rolls.....	7¼¢..... 20% off
Sheet Lead, cut.....	7¾¢..... 20% off

Old Lead in exchange, 4¢ ₩ lb.

Solder.

½ & ½, guaranteed..... 17½@18 ¢
No. 1..... 14½@16½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ¾¢ ₩ lb.

Cookson.....	₩ lb 10½@11¢
Hallett's.....	₩ lb 8½@9 ¢
U. S.....	₩ lb 8½@9 ¢

Aluminum—

Duty: Crude, 8¢ ₩ lb. Plates, Sheets, Bars and Rods, 18¢ ₩ lb.

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:
Small lots..... ₩ lb 37¢
100-lb lots..... ₩ lb 35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:
Small lots..... ₩ lb 34¢
100-lb lots..... ₩ lb 33¢

Aluminum Sheet, B. & S. gauge, 50 lb or more.

Wider than	8-in.	14-in.	24-in.
And including	14-in.	24-in.	30-in.
	₩ lb.	₩ lb.	₩ lb
Nos. 13 to 19.....	$0.42	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23.....	.46	.48	.51
No. 24.....	.48	.50	.53
No. 25.....	.47	.51	.54
No. 26.....	.47	.54	.59
No. 27.....	.48	.57	.62
No. 28.....	.48	.57	.64
No. 29.....	.49	.60	.69
No. 30.....	.50	.64	.77

Note.—Lots of less than 50 lb ₩ lb extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9	₩ lb 40¢	No. 15.....	₩ lb 45¢
No. 9 to No. 10..	₩ lb 40½¢	No. 17.....	₩ lb 50¢
No. 11.....	₩ lb 41 ¢	No. 18.....	₩ lb 55¢
No. 12.....	₩ lb 41½¢	No. 19.....	₩ lb 60¢
No. 13.....	₩ lb 42 ¢	No. 20.....	₩ lb 65¢
No 14	₩ lb 4 1½¢	No. 21.....	₩ lb 85¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper.....	₩ lb 14@ ¢
Light and Tinned Copper.....	₩ lb 12@ ¢
Heavy Brass.....	₩ lb 9@ ¢
Light Brass.....	₩ lb 7@ ¢
Lead.....	₩ lb 4 ¢
Tea Lead.....	₩ lb 3½¢
Zinc.....	₩ lb 2½¢
No. 1 Pewter.....	₩ lb 17@ ¢
No. 2 Pewter.....	₩ lb 8½¢
Tin Plate Scrap.....	₩ ton $6.50 @ 7.00
Wrought Scrap Iron.....	₩ gross ton $10.50@11.00
Heavy Cast Scrap.....	₩ gross ton $10.25@10.50
Stove Plate Scrap.....	₩ gross ton $7.25@ 7.50
Burnt Iron.....	₩ gross ton $5.00@ 5.50